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ABSTRACT

This proceedings contains papers from the 1999 annual conference of the North East Association for Institutional Research. The papers are: (1) "A Marketing Research Program for Commuter Colleges" (Michelle S. Appel and Craig A. Clagett); (2) "Where Do I Start? Determining Institutional Information Needs beyond Mandated Reporting" (Michelle S. Appel and Craig A. Clagett); (3) "The Development of a Freshman Experience Survey" (Penny Blackwood and Jason Casey); (4) "Above the Bottom Line: Assessing Academic Through-Put by Means of Aggregate Course Hour Analysis" (Karl Boughan); (5) "What's in a Name Change? Using CIRP Data at a Transitional Two-Year College" (Stephen Cunningham); (6) "Institutional Researchers as Leaders in Policy: Perspective and Possibilities" (Anne Marie Delaney); (7)"Pre-College Characteristics and Freshman Year Experiences as Predictors of 8-year Academic Outcomes" (Jeffrey T. Gerken and J. Frederick Volkwein); (8) "Online Courses: Who's Taking Them, Why, and Are They Successful?" (Diane J. Goldsmith); (9) "Who Talks to Whom on Campus: Using a Survey of Staff Satisfaction with the Service of University Offices To Describe the Structure of Administrative Life" (James J. Hughes and William S. Stuart); (10) "The Effect of Expectations vs. Experience on Retention at Monroe Community College" (Suzanne M. Johnson); (11) "The Development of a Web-Based Survey: Survey Design to Data Analysis" (Heather A. Kelly); (12) "Electronic Fact Book: A Reality of Today" (Gurvinder K. Khaneja and Amarjit Kaur); (13) "The Analysis of the General Studies Curriculum at a Public Urban University: What Worked and What Did Not" (Arthur Kramer and Ansley W. LaMar); (14) "Measuring Student Success in Remedial Education Programs: A Case for Using a Modified Version of the Student Right To Know Methodology with Eight Criteria for Measuring Student Progress along the Way" (Marcia M. Lee); (15) "What Have Connecticut Public High School Graduates Been Doing and How Many of Them Will There Be? An Analysis of High School Graduates and Projection Data" (Qing Lin Mack); (16) "What Prevents the Development of Distance Learning in the Higher Education Market?" (Yuko Mulugetta and Abraham Mulugetta); (17) "Factors Associated with Retention in a Distance-Based Liberal Arts Program" (Mitchell S. Nesler); (18) "Including Transfer-Out Behavior in Retention Models: Using the NSLC Enrollment Search Data" (Stephen R. Porter); (19) "Implications of Age on Success in Computer-Based Remedial Education" (Michael K. Schuchert); (20) "Factors in Early College Academic Performance: Does Race Matter?" (William S. Stuart); (21) "The Mission of Institutional Research" (Stephen W. Thorpe); (22) "The Impact of Remedial Mathematics Courses on Student

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College-Level Mathematics Performance and Persistence" (Meihua Zhai and Jennie Skerl); and (23) "The Role of the Institutional Research Office in the Institutional Accreditation Self-Study Process" (Marianthi Zikopoulos and Christopher Hourigan). Each paper contains references. A listing of the conference program and the 1999 association membership roster are included. (Contains 65 tables and 8 figures.) (SLD)

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26th Annual Conference

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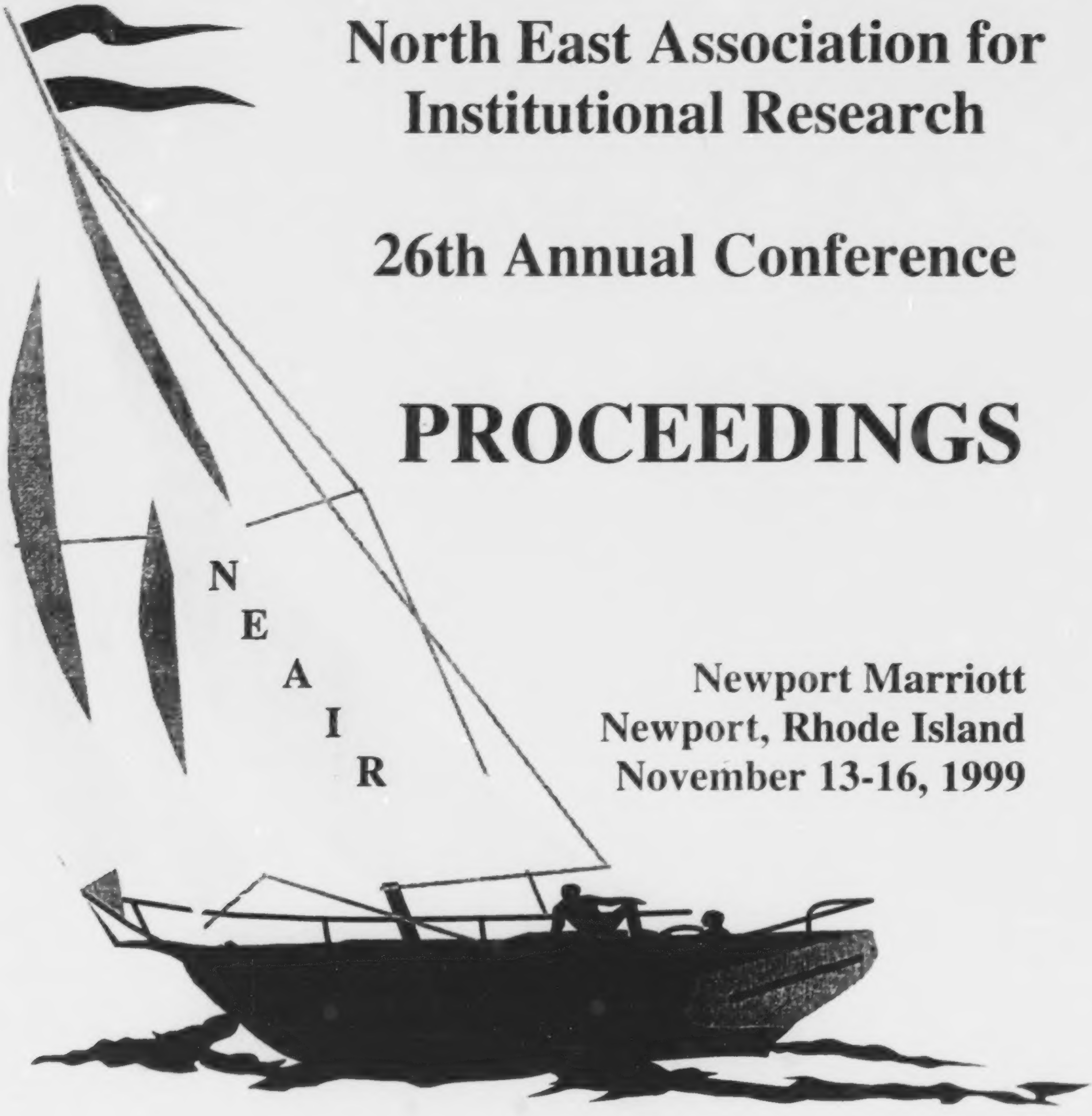

Newport Marriott
Newport, Rhode Island
November 13-16, 1999

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Charting the Course for Institutional Research

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NEAIR Friends and Colleagues:

The 26th annual conference of the North East Association for Institutional Research was celebrated November 13-16, 1999 at the Newport Marriott in the nautical setting of Newport, Rhode Island. While these Proceedings include the majority of intellectual content shared at the meeting, they can not capture the spirit of camaraderie, support, professional commitment, and fun that permeated the conference. Our conference attendance of 235 ranked fourth highest in our 26 years of annual meetings. It is clear to me that NEAIR is a valuable organization for its members. As we provide professional development, networking, and a forum to discuss the aspects of IR, we enable our members to strengthen their knowledge as we approach the next millennium.

NEAIR's long-standing policy of entrusting the conference planning and execution to a program chair and local arrangements chair succeeded in offering a superb conference for all attendees. As program chair, Bob Yanckello reached for the gold and compiled a stimulating and rounded set of plenary speakers and other presenters. Dr. Claire Gaudiani, President of Connecticut College, instilled us with great enthusiasm in her opening plenary discussion on ties between the college and the community. Dr. George Kuh, Indiana University Professor of Higher Education and Director of the CSEQ project, shared his insights on the benefits of data received from IR as well as offering an update on the National Study of Student Engagement. In addition to our two plenary speakers, our program consisted of 10 preconference workshops, 44 papers, panels, and special interest groups, 17 workshares, and five vendor showcases.

As Local Arrangements Chair, Nancy Rieser collaboratively coordinated a committee of dedicated NEAIR colleagues who dazzled us with the sights and sounds of Newport. We feasted on lobster and listened to Newport jazz. We toured the mansions, and enjoyed harbor views of sailboats and seagulls. We met new friends and colleagues throughout the conference, and we re-energized ourselves with a walk or run on the spectacular Cliffwalk. I think I can rightfully boast and say that our Newport conference was one of the best on record!

During this past year, we welcomed Beth Simpson and the HEDS professionals into our group as membership secretary. Due to the superb organization and efforts of our former membership secretary, Brenda Bretz, Beth was able to step in and make a smooth transition into this role. I am deeply indebted to Beth for helping to make this transition and the Newport conference smooth and trouble-free.

I also need to thank the NEAIR Steering Committee who kept me on track during this past year. I am appreciative of each member's suggestions and comments on the items we discussed throughout the year. Each member provided wisdom and professionalism that allowed us to engage in frank and open discussions that will benefit the association's future.

Finally, my gratitude to Heather Kelly, our Publications Chair, who has spent many hours preparing this document. Her work in collecting, editing, and producing the Proceedings in both electronic and paper form, is greatly appreciated. Her work has helped us preserve a piece of intellectual history that will be read by many in the years to come.

Karen W. Bauer, Ph.D.
NEAIR President, 1998-99

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A MARKETING RESEARCH PROGRAM FOR COMMUTER COLLEGES

Michelle S. Appel, Coordinator of Institutional Research
Craig A. Clagett, Vice President for Planning, Marketing and Assessment
Carroll Community College

An effective marketing program can contribute to a college's growth, financial health, and service to the community. A successful marketing program will identify the education and training needs of the citizens, businesses, and organizations in the college's service area; develop products and services to meet those needs, consistent with the college's mission and values; and communicate the value of participating in the college's offerings through targeted messages and appropriate media. Each of these steps requires accurate and up-to-date market information to be most effective.

In this paper, eight elements of a comprehensive marketing research program appropriate for commuter colleges will be described and evaluated. Together, they comprise the information infrastructure necessary for planning and implementing a successful marketing program. The eight elements are:

- ***Secondary research in conjunction with the college's formal environmental scanning*** to identify and profile major market segments, and thorough market analyses of each segment including determination of market size, needs and aspirations, enrollment history, market share, market competition, market position, marketing history, strategic fit, market risk, and market potential.

- ***A needs assessment study of the local business community*** to determine the types of management and employee professional development and skill training needed; the preferred format for such training; the ways local companies, organizations, and government agencies have met such needs in the past; and their perceptions of past and potential training providers.

- ***A telephone survey of adult residents of the service area*** to assess educational and training experiences, needs, and plans; ascertain the college's market position relative to alternative providers; and evaluate current institutional marketing efforts.

- ***A classroom survey of current students*** to gather student ratings of college services; determine the efficacy of college marketing efforts; learn about student computer ownership and use; and gather additional student background information not collected in routine transactions such as application and registration processes.

- ***Survey of new students at orientation*** to learn about college-choice decisions, the institution's current competition, reasons for choosing the college, awareness of college marketing efforts, and student computer experience.

- ***Focus groups*** with high school students to test awareness of the college, its image, and the likely success of proposed marketing themes and products.

- ***Brainstorming sessions*** with long-time members of the college's faculty and staff to learn their perceptions of student needs, and to identify the college's strategic assets and liabilities from their viewpoint.

- ***Solicitation of marketing ideas from the college community*** through widespread dissemination of Marketing Action Proposal (MAP) forms, both paper and electronic.

With the direction and coordination of its Marketing Team, Carroll Community College has implemented the above marketing research program. The purposes, methodologies, selected findings, and early lessons from each element will be reviewed. In addition, the paper will demonstrate how development of the information infrastructure necessary for effective marketing complemented the data needs of the college's new Planning Advisory Council and its Middle States re-accreditation self-study committee. The complementarity of information needs among institutional planning, marketing, accreditation, assessment, and accountability functions suggests that colleges might consider placing these functions under the responsibility of a single vice president. Including institutional research and analysis in the same area would be appropriate under such a model.

Secondary Research Market Analysis

The starting point is to collect and analyze data from existing sources using a comprehensive environmental scan. Prepared to support institutional strategic planning, and encompassing identification and analysis of demographic, economic, technological, legal-political, and socio-cultural trends, the environmental scan comprises a superb beginning for a market research program. A wealth of data is available from government and other sources, most of it free and often accessible on the Web. Population profiles and forecasts, commuting patterns, migration flows, occupational demand data, economic development priorities, industrial profiles, and similar scan data should be shared with campus marketing teams. Of course, information on college-going rates of the college's service population, college market shares, and offerings of competitor institutions are most pertinent to marketing plans.

The environmental scan indicated that the Carroll county population grew almost 20 percent over a seven year period (1990 to 1997). The county population is expected to grow in the 15 to 24 year old and over 50 year old segments. Meanwhile the college's traditional returning student market, the 25 to 49 year olds, is expected to sustain flat to minimal growth. Employment data indicated that the number of residents commuting to jobs outside the county was almost equal to the number of employees within the county. Although the median household income of county residents was ranked 6th within the state, the average weekly wage of persons at county employer locations was ranked 17th. Data suggested that job demand within the county is for unskilled, manual or service labor.

The environmental scan included a market share analysis to determine the college's position relative to other higher education options within the state. In the fall 1998, 43 percent of the county's first-time, full-time undergraduates attended Carroll Community College. Twenty-nine percent of all county undergraduates attended Carroll. The college enjoyed its largest market share in the part-time market segment – 67 percent of all 1998 county part-time undergraduates attended Carroll Community College.

The need to segment a college's market is self-evident. The postsecondary education needs of the 100,000 adult residents and 5,000 businesses in Carroll County are not all the same. Markets can be segmented geographically, demographically, psychographically, geo-demographically, and behaviorally. Each market segment should be *distinct* enough to warrant specific marketing efforts, *large* enough to warrant the expense and effort of a specialized, targeted campaign, and *reachable* by affordable marketing activities. The market segmentation scheme developed by the Carroll Community College Marketing Team as part of the environmental scan is shown on the next page. From this initial, lengthy list of potential target markets, the college may choose a small number for priority marketing attention in a given marketing plan.

Whatever segmentation scheme is adopted, each market segment must be analyzed to determine its priority in the college-wide marketing plan. The analyses inform development of subsequent marketing action plans. Each market analysis should include the following components, as appropriate: market size, market needs and aspirations, enrollment history: five-year trend in enrollments at Carroll Community College from this market, market share: percentage of market attending Carroll Community College; direction of recent trend in market share, market competition, market position, marketing history: current and past-year Carroll Community College marketing efforts targeted at this market, strategic fit, market risk, market potential.

Needs Assessment Survey of Local Business Community

A primary mission of most community-oriented colleges is to serve the economic development needs of their service area. Thus it is essential that the institution understand the local economy, the outlook for employment by occupational type, the specific current and anticipated job openings of local employers, job skill training needs of local industry, and the need for professional licensure, certification, and continuing education. Surveys, visits to employer locations by college teams, curriculum advisory boards, DACUM exercises, breakfast or luncheon events hosted on campus, personal interviews with the college president and/or senior college administrators and faculty—

these are several of the ways colleges can learn the needs of surrounding business and industry. It is particularly useful for partnerships to be developed with the local Chamber of Commerce and governmental or quasi-governmental economic development commissions. In Carroll County, the community college was able to gain this information through a survey sponsored by the Carroll County Department of Economic Development.

Telephone Survey of Adult Population in College's Service Area

U.S. Department of Education studies have found that 40 percent of the adult population in the country participate in adult education each year. A majority are pursuing job-related training. Half of all citizens age 35 to 54 participated in formal education and training activities in 1995, up from only 17 percent ten years earlier. The need for continuous job skill development—the "fusion of learning and earning" cited by futurists—is attracting new competitors, such as the University of Phoenix and other for-profit firms targeting the working adult market. Colleges and universities need to know as much as they can about the postsecondary training and education needs of the adult population in their service area.

The best way to learn about the needs of a large adult service population is through telephone polling. Written surveys are not usually successful, as they suffer from both response bias and poor response rates. Most colleges are not sufficiently staffed to properly conduct telephone surveys, although some have used student and staff volunteers as interviewers. To avoid the total cost associated with contracting Carroll Community College contracted the interviewing component alone. A telephone interviewing contractor was hired to conduct 400 interviews of randomly selected county adults. After the appropriate protocols to ensure proper sampling, the interview proceeded with questions in the following areas:

Recent educational experiences Respondents were asked if they had taken any courses or training within the past two years, where they had received the instruction, whether the training was for degree-credit or not, and if it was job related.

The largest group of respondents (31%) indicated that they had taken courses at Carroll Community College. This was more than twice that of the next closest competitor, a nearby public four-year institution with a large commuter population (14%). All other institutions were reported by fewer than 10 percent of the respondents.

Educational plans To estimate the near-term, future market for postsecondary training and education in the county, respondents were asked their educational plans for the next two years. Included were questions about their reason for taking a class, the specific kind of training or course they would most likely want (recorded verbatim), what factors would be most important in their choice of where to take a course, and the institution they would be most likely to attend.

The greatest demand for courses among the county adults was for computer training (20%), followed by business (7%), education (6%), and general academics (4%). Over 40 percent of the respondents indicated that they would fulfill their future educational needs at the community college. The next closest competitor was named by only 14 percent of the respondents. Respondents were asked to rate a variety of factors considered in choosing an institution on a scale of 5 (very important) to 1 (not at all important). Convenient class starts and up-to-date technology had the highest mean ratings of importance, while sports programs had the lowest (see table).

Factors in Selecting an Institution: Mean Ratings

Most Important Factors		Least Important Factors	
Start when you need	4.24	Sports program	2.29
Up-to-date computers	4.23	Clubs or activities	2.52
Faculty credentials	4.21	Child care	2.81
Close location	4.05		
Small classes	4.05		
Convenient parking	4.04		
Friendly staff/faculty	4.01		

Knowledge of Carroll Community College A major purpose of the phone survey was to learn what county residents knew about the college. Respondents were read a series of thirteen statements about the college and asked to indicate if they thought the statements were true or false (or if they had no idea, to indicate they didn't know). The survey also asked respondents to estimate the cost of a typical course at the college and at two competitor institutions.

Forty-nine percent of the respondents were unable to answer more than 7 of the 13 items correctly. Items which were most frequently missed were those which related to specific college services or policies. Those which were frequently answered correctly were those about general college policies and characteristics– the transferability of credits across the state system, the absence of dormitories – and those related to specific, innovative programs.

Awareness of Carroll Community College marketing efforts. To assist the Marketing Team in assessing past marketing efforts, respondents were asked several questions concerning their recall of college print, radio, television, and billboard advertising, including identification of marketing slogans and the college logo. Also included were questions about visits to campus and receipt and use of the college schedule of classes (which is mailed county-wide to all households).

The college's most effective method of communicating with county residents was the mailing of the schedule (see table). Over three-quarters of the respondents remembered receiving a schedule; 88 percent of these respondents reported reading the schedule and 44 percent indicated that they kept the schedule for a week or more.

Recollection of Marketing Efforts: County Adults

	Percent Recalling
Course schedule mailing	86%
Newspaper advertisement	63%
Radio advertisement	20%
Cable television advertisement	16%
Billboard	12%
College representative at community event	8%
Movie screen advertisement	1%

Only 7 percent of the respondents were able to correctly describe the college's logo. When asked to name the college advertising theme, 9 percent named the college's former theme while only 1 percent named the current advertising theme.

Computer access and use To help the college plan programming, course delivery, and marketing efforts, respondents were asked a number of questions about their access to, and current use of, computers. Frequency of email and Web search activity, and experience with the college's website were among the questions asked.

Three-quarters of the respondents reported that they have a home computer. Another 5 percent had computer access exclusively at their workplace. Almost one quarter of the respondents had access to a computer both at home and at work. Most of these computers included CD-ROM drives and Internet access, including e-mail. Of those with access to computers, the web, and e-mail, the vast majority utilized the technology at the highest frequency option presented to them.

On-line course experience and receptivity To further explore the potential for on-line course and service delivery by the college, and the enrollment risk potential of alternate providers using distance technologies, respondents were asked if they had ever taken a course or other type of training over the Internet and, whether they had or not, how likely they might be to do so in the future.

Over one third (36%) of the respondents were receptive to taking a course on the Internet. In fact, 9 percent indicated that they had already taken a course or training over the Internet at the time of the telephone interview.

Employment Respondents were asked if they were employed, if this was full- or part-time, in what county they were employed, in what industry they worked, and for their job title (which was recorded verbatim for later coding). It was known that a large proportion of county residents commuted to work outside Carroll County, and the college wanted to know the kinds of work residents were commuting to.

Demographics To interpret the survey results, and check the profile of respondents for representativeness, a series of demographic questions including respondent age, current education, residence, household income, and sex were asked.

Open-ended image probes The interview ended with two open-ended questions, asking the respondent to name the most favorable and most unfavorable things they had heard about the college.

Customer Service Survey of Currently-enrolled Students

A key component of successful marketing is point-of-service contact with customers. The successful efforts of an advertising and recruiting campaign can be dashed in minutes by poor customer service. Colleges should routinely survey their students to learn their levels of satisfaction with the college. In addition to open-ended questions to elicit both favorable comments and student complaints, current-student surveys should include student ratings of the various services offered to students. The table below is illustrative of the data such surveys can reveal (ratings of "3"—the scale midpoint—are not shown).

Carroll Community College used the student satisfaction survey as an opportunity to elicit opinions on a variety of other marketing-related items, including usefulness of materials, consideration of other institutions, radio and newspaper preferences, reasons for attending, and receptiveness to new services. Students found the schedule mailing, the catalog, and the college website most useful in learning about the college. Almost two-thirds (63%)of the students indicated that they did not seriously consider attending any other institution prior to enrolling at Carroll Community College. Students chose Carroll for its location, cost and transferability of credits. Students' access to and use of technology mirrored that of the county residents.

Top Rated Services – Student Survey of College Services
Spring 1999 Credit Student Survey
(Five-point Satisfaction Scale)

	Satisfied	Dissatisfied	Mean Rating
Campus safety	90%	2%	4.32
Welcoming campus	87	2	4.21
Quality of instruction	88	2	4.15
Faculty attitude toward students	85	3	4.15
Registration	84	5	4.14
Library services	83	2	4.12
Access to computers	81	8	4.08
Availability of faculty outside class	78	4	4.04
Classroom technology	79	4	4.01
Admissions	80	4	4.01

Survey of New Students at Orientation

Colleges need to understand the decision calculus students use in choosing where to go to college. A brief written survey administered during new student orientation is helpful. Carroll Community College surveyed 204 new students during an August day-long orientation. These students were remembered many of the college's advertisements, including radio and television ads, with greater frequency than did the county adults (see table). It is likely that this is in part due to their anticipation of their upcoming enrollment – when they heard or saw the ad, they thought "Hey, I'm going there soon." The most recalled effort was a direct mail postcard campaign, recalled by over half of the new students. Less than 10 percent of the students recalled advertisements in high school music and athletic programs, a newspaper ad in the Baltimore Sun, and the web.

Recollection of Marketing Efforts: New Students

	Percent Recalling
Postcard	56%
Radio advertisement	45%
Cable television advertisement	44%
Advertisement on high school book cover	40%
High school yearbook advertisement	37%
Local newspaper advertisement	30%
High school newspaper advertisement	30%
Billboard	13%
Movie screen advertisement	13%

Students were asked to rate how important various possible influences were on their college choice, such as prior attendance by family or friends, credentials of faculty, admission policies, student activities, campus location, cost of attending, programs and courses offered, recommendations of high school teachers or counselors, scheduling options, campus technology, class size, and support services. The atmosphere, the personal attention from the faculty, a location close to home, program offerings, and cost were all import reasons for attendance among the new students.

The orientation survey was also an opportunity to learn more about student computer experience, interest in student clubs, and the effectiveness of specific college initiatives. Due to the volume of activities typically associated with orientation, a short survey requiring approximately five minutes to complete is recommended.

Focus Group Research

A complete marketing research program will include qualitative research such as focus groups. Focus group interviews were used to better understand why the students made the choice to attend Carroll and to test publications and marketing themes. A gift certificate for the book store was used as an incentive for participation in the focus groups, held at the conclusion of the orientation. Three focus groups of six students were recruited. All of the participants were recently high school graduates or concurrently enrolled high school students. The reasons students gave for attendance and their opinions of the importance of the college's extracurricular offerings in those decisions supported conclusions from the quantitative data which had been collected.

Copies of class schedules from a variety of institutions, in a variety of formats, and with a variety of graphical designs were passed around and then the group was asked to comment on their best and worst features. Similarly, a diverse series of marketing slogans and logo designs was prepared for participant reaction. In addition to the college's current and proposed themes, ideas from competitors and other institutions were recreated with the identifying names removed to test for effectiveness. It was important to test advertising ideas with the intended audience. For example, these groups of 18-year olds did not understand "2001—a learning odyssey." An older group, even if they didn't like it, would probably get it. The feedback received from these students has been used in the design of a new freshmen recruitment campaign.

Brainstorming Sessions with Faculty and Staff

Data gathering should not neglect the wealth of experience accumulated by college faculty and staff who often have much to share based on their interactions with students and the surrounding community. Several formal brainstorming sessions should be held to collect the opinions of key employees, who because of their positions and experience at the institution have insights useful to marketing plans.

One useful technique is to conduct a SWOT—strengths, weaknesses, opportunities, threats—analysis. A final product that might result from a cross-impact analysis combining the internal and external assessments could be a listing of strategic assets and strategic vulnerabilities.

College-wide Solicitation of Marketing Action Proposals

The final component of a comprehensive market research program consists of an institution-wide appeal for marketing ideas. Great ideas are not the exclusive domain of the people who come to mind when forming marketing and enrollment management teams. Staff with point-of-contact interactions with students, custodial, grounds-keeping, and maintenance workers, anyone with experience with service organizations as a customer or provider, may have a terrific idea applicable to the institution's marketing plan. Carroll Community College's marketing team solicited these types of ideas in meetings, via campus-wide email appeals, through circulation of Marketing Action Proposal forms (see next page), or by other means.

The Marketing Team's appeal for marketing ideas from the Carroll Community College community in 1999 attracted over 120 separate Marketing Action Proposal forms. After duplicate ideas were eliminated, the Team had 92 separate suggestions to consider. These were compiled in a table with the proposals sorted under ten headings: product development/repackaging/ promotion, image enhancement and community outreach, high schools, middle schools, county businesses and organizations, county adults age 19-59, students at other colleges, senior citizens, customer service, and market research (see sample display below).

The Next Step: Development of Two-year Marketing Plan

Completion of the eight components of the comprehensive market research program will provide the information infrastructure needed to guide development of institutional marketing plans. The Marketing and Enrollment Management Team will identify the overall marketing strategies and priority marketing initiatives needed to reach the college's enrollment goals.

Detailed marketing action plans will be developed to implement the strategies included in the two-year plan. Recommended action plans will include the following components, as appropriate: target market; product or service; specification of the media for communicating to target market(s); listing of the specific steps required to accomplish the proposed marketing action, complete with target date for each step; name of the individual(s) who will direct the design, implementation, and reporting on progress of action plan; specification of the marketing plan enrollment objective(s) or Master Plan Institutional Effectiveness Assessment Measure(s) addressed by the proposed action and/or identification of alternative measures of action plan success; staffing requirements; estimated dollar cost; and proposed source of funds.

The marketing plan must include a detailed marketing budget reflecting the recommended strategies and actions. Further description of the development, contents, and use of marketing plans is beyond the scope of this paper.

Summary

This article has identified an eight-component model for creating the market research information base needed for commuter colleges to effectively market their products and services. It has argued that all eight components are needed. The components include: secondary research, business community needs assessment, telephone survey of adult residents, customer service survey of current students, survey of new students, focus groups, brainstorming sessions with college employees, college-wide solicitation of marketing ideas

While representing considerable institutional commitment, resources, and effort, completion of this comprehensive market research program encourages the wise use of the college's much larger commitment of resources and effort in marketing and advertising. Both the effectiveness and efficiency of marketing expenditures should be improved by the development and use of the information base advocated here.

WHERE DO I START?
DETERMINING INSTITUTIONAL INFORMATION NEEDS BEYOND MANDATED REPORTING

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Although the institutional research (IR) profession has evolved into an integral part of data-based decision making and policy analysis, at many smaller, developing institutions the IR function is still descriptive, with a focus on external reporting. At many of these developing institutions registrars, database administrators, or personnel from a variety of other areas are responsible for the traditional, descriptive IR functions. As institutions realize the value of information in their planning and policy development they begin to assemble a formal, distinct IR area with a focus on providing data and policy analyses for decision making. This shift provides an interesting set of challenges as researchers and members of the institutional community begin to define their roles in relation to each other.

In this environment, starved of data and attempting to make data-based decisions, prioritizing institutional information needs beyond external reporting can be a daunting task. Individuals or interest groups often have agendas for which they would like data to support their own view. Administrators and institutional governing bodies may have postponed important policy decisions with the litany "Wait until we see what the data say." Often, a single person is brought in to generate this information, and competition for the time and energy of that person is great. Given these competing demands, the researcher could easily throw up his or her hands and say, "Where do I start!?"

This paper discusses one college's solution – the development and administration of a college-wide information needs assessment. The specific experience of developing and administering an information needs assessment at Carroll Community College is discussed; results of the survey, analyzed separately for faculty, student development staff, administration, and extended learning staff are shared; and, finally, the ways in which this information was used to prioritize projects and to plan for the expansion of the IR office will be discussed. While targeted at new IR shops beginning to define priorities, this presentation will be informative for any researcher or manager attempting to more clearly define the informational priorities of his or her institution.

Background

During the period 1996 through 1998, Carroll Community College was without any formal institutional researcher. Although a faculty member was assigned to examine learning outcomes, and was aided by a member of the records staff who completed mandated reports, the college had no research professional to meet its needs for decision support data. Without a dedicated staff member, management information and outcomes assessment had been relegated to a back burner.

In the winter of 1998-99, Carroll Community College experienced significant changes in its administration, including a transition in its executive leadership. With a focus on outcomes assessment and data-base decision making, the incoming President hired a new Vice President for Planning, Marketing, and Assessment. The new vice president conducted structured interviews with members of the college's Planning Council, which revealed a widespread frustration with the lack of policy-relevant information available to campus decision makers. In response, a new Office of Institutional Research was created, and a Coordinator of Institutional Research was hired. Almost immediately, the daunting task of determining and prioritizing the institutions information needs arose.

At about the same time, the institution was attempting to determine how best to meet the campuses needs for access to its new student information system. In spring 1998, Carroll Community College completed its installation of the new Datatel Student Information System. During the first year of the system's use, access to information was limited to those users for whom entry or access of the data is necessary for their job function. It was determined that more members of the community should have access to the system, but only to that data which they actually needed.

To better understand what types of information the community considered necessary, an Information Needs Assessment was designed. The first portion of the survey was designed to determine how best to deploy the Datatel system, and these results are shared within a different report. The second portion of the survey examined the need for analyses and reports, data which would be synthesized to aid in decision making. It is these results which are reported in this paper.

Methodology

All full-time faculty and staff were mailed the Information Needs Assessment in early February, 1999 and given until March 1 to respond. The instrument contained a list of analyses and reports which might be provided by the Office of Institutional Research. For each item, respondents were asked to rate on a scale of 1 to 5 how necessary they considered the information. They were then asked to indicate how they would like to receive the information, via a paper report, e-mail, or a web site. Three different colored versions were used to differentiate between faculty, administrative and support staff. One week prior to the due date, a campus-wide e-mail was sent as a reminder to complete and return the survey.

Table 1 contains the number of surveys administered and the response rates for faculty, administrative staff, and support staff. The survey was well received, with an overall response rate of over 54 percent. This high response rate is likely indicative of the considerable interest within the college community for information. With almost two-thirds of the faculty and administrators responding, it is likely that the sample is representative of these groups of employees in general and particularly of those persons who will use information. The lower response rate for the support staff likely reflects not a lack of interest but a perception that the survey was not applicable to them. (For instance, a comment from one member of the support staff indicated that her information needs were determined by her supervisor's requests.) Additionally, many employees classified as support staff had already been given the access to the Datatel system they needed to perform their job and had few needs for more complicated analyses or reports.

Table 1: Surveys administered and response rates by employee classification

	Surveys Administered	Responses	Response Rate
Administrators	55	37	67%
Faculty	41	26	63%
Support Staff	60	22	37%
TOTAL	156	85	55%

Results were analyzed by area of responsibility: faculty, Student Development staff, Administration (including Institutional Advancement and Planning, Marketing and Assessment) staff, and Extended Learning and Workforce Development staff. The results are presented separately for each group, followed by common findings. Appendix A contains tables of the frequencies of responses to each item. Percentages were calculated based on the number of valid responses to the individual item, not on the total number of respondents.

Data Analysis and Interpretation Needs

Faculty

The majority of faculty respondents indicated that they wanted data analysis and interpretation presented via a web site. For every item, the web presentation option was preferred by more respondents than the paper report or e-mail option.

Mean ratings of the necessity of the different analyses were high (see Table 2), with only six mean ratings lower than 3.50 on the five point scale: annual unduplicated headcount, distance learning student profiles, credit-free student profile, enrollment by ZIP code, extended learning enrollment trends, and financial aid information. Perhaps credit faculty viewed these items as less relevant to their classroom instruction.

Table 2: Mean Necessity Ratings – Faculty

Item	Mean
Transfer destinations	4.33
Graduate Follow-Up survey findings	4.33
Trends in student curriculum choices	4.26
Term-to-term retention analysis	4.25
Transfer performance at 4 year colleges	4.25
Graduate job placement analysis	4.22
Fall trends in enrollment by discipline	4.17
Course pass rates	4.13
Student customer satisfaction surveys	4.13
Market shares – residents	4.09
Market shares – high school grads	4.09
Credit enrollment projections	4.04
Degrees and certificates awarded	4.04
Graduation/transfer rate analysis	4.00
Summer credit student profile	3.86
Fall credit student profile	3.83
Spring credit student profile	3.83
Transitional student enrollment trends	3.74
Carroll County demographics	3.73
Winter credit student profile	3.65
Annual unduplicated headcount analysis	3.43
Distance Learning student profiles	3.29
Credit-free student profile	3.00
Enrollment by ZIP code	2.87
Extended Learning enrollment trends	2.87
Financial aid by type, # of recipients	2.87

Note: n between 22 and 25 for all items

Credit faculty clearly indicated that information about student success was necessary. Course pass rates, retention analyses, graduation/transfer analyses, graduate job placement analysis, transfer analysis, transfer performance, and degrees and certificates awarded all had 50 percent or more of the respondents indicating that they were "very" necessary. In addition, more than half of the respondents indicated that analyses of student satisfaction, measured by student surveys and the Graduate Follow-Up survey, trends in student curriculum choices, and credit enrollment projections were "very" important.

Student Development Staff

As was the case with faculty, staff members in the Student Development area expressed a clear preference for website dissemination of information.

Mean ratings of the necessity of the data clustered around the midpoint of the five-point scale (see Table 3). Only one mean rating was higher than 3.5 and none were lower than 2.0. Only four items had mean necessity ratings under 2.5: enrollment by ZIP code, credit-free student profile, financial aid information, and extended learning enrollment trends.

For most items, more than one third of the respondents indicated that the analysis was "not at all" necessary. For three items (credit-free student profile, enrollment by ZIP code, and financial aid by type) more than half of the Student Development respondents indicated that the analysis was "not at all" necessary. The only items rated as "not at all" necessary by fewer than one third of the Student Development respondents were credit enrollment projections, trends in curriculum choices, degrees and certificates awarded, and student satisfaction surveys. Perhaps this is due to the relatively large proportion support staff (13 of the 30 respondents) in the respondent pool for Student Development. Many of the analyses listed were those that would be useful in planning and enrollment management, functions that support staff may not identify as part of their job.

A considerable portion of the Student Development respondents indicated a need for student success information. Analyses of retention, graduation/transfer rates, graduate job placement, transfer, and the number of degrees and certificates awarded were rated as "very" necessary by more than one third of the respondents. These are all areas directly impacted by the work of the Student Development area. In addition, information about high school market shares, student customer satisfaction, and Graduate Follow-Up survey findings were also rated as "very" necessary by more than one third of the respondents. In fact, a majority of the respondents (54%) found student customer satisfaction information "very" necessary.

Administrative Area Staff

Web dissemination of information received the most responses from those staff in administrative areas for all but a few items. In four areas – credit enrollment projections, graduate job placement, student satisfaction surveys, and Graduate Follow-Up survey findings – the number of respondents who indicated that they wanted to receive a paper report was equal to the number who desired web presentation. This may be due to the sensitive nature of these data; respondents may have had a concern about putting this type of information on the web where anyone can access it.

Table 3: Mean Necessity Ratings – Student Development

Item	Mean
Student customer satisfaction surveys	3.62
Trends in student curriculum choices	3.27
Graduate Follow-Up survey findings	3.23
Credit enrollment projections	3.22
Degrees and certificates awarded	3.21
Transfer destinations	3.16
Term-to-term retention analysis	3.12
Fall credit student profile	3.00
Spring credit student profile	3.00
Winter credit student profile	3.00
Market shares – residents	2.96
Market shares – high school grads	2.96
Summer credit student profile	2.96
Fall trends in enrollment by discipline	2.96
Transitional student enrollment trends	2.92
Distance Learning student profiles	2.92
Graduation/transfer rate analysis	2.92
Graduate job placement analysis	2.92
Annual unduplicated headcount analysis	2.88
Carroll County demographics	2.81
Transfer performance at 4 year colleges	2.76
Course pass rates	2.64
Enrollment by ZIP code	2.27
Credit-free student profile	2.24
Financial aid by type, # of recipients	2.19
Extended Learning enrollment trends	2.16

Note: n between 24 and 27 for each item

Table 4 contains the mean necessity ratings of the Administration area staff. The analyses which received the highest mean necessity ratings were the student satisfaction survey, and each of the student profiles. Only two analyses, course pass rates and graduation/transfer rates, had mean ratings below 2.5. Student customer satisfaction surveys had the highest mean. The remaining means were clustered around the midpoint of the five point scale.

Table 4: Mean Necessity Ratings – Administration

Item	Mean
Student customer satisfaction surveys	4.00
Fall credit student profile	3.67
Spring credit student profile	3.67
Winter credit student profile	3.67
Summer credit student profile	3.67
Credit-free student profile	3.50
Credit enrollment projections	3.47
Carroll County demographics	3.37
Market shares – residents	3.37
Graduate Follow-Up survey findings	3.35
Market shares – high school grads	3.32
Annual unduplicated headcount analysis	3.29
Financial aid by type, # of recipients	3.24
Trends in student curriculum choices	3.11
Distance Learning student profiles	3.00
Term-to-term retention analysis	3.00
Transfer performance at 4 year colleges	3.00
Degrees and certificates awarded	3.00
Extended Learning enrollment trends	2.95
Transitional student enrollment trends	2.89
Enrollment by ZIP code	2.83
Transfer destinations	2.72
Graduate job placement analysis	2.67
Fall trends in enrollment by discipline	2.59
Graduation/transfer rate analysis	2.47
Course pass rates	2.35

Note: n between 17 and 19 for each item

Respondents from administrative areas appeared to find information about the demographics of the county and of the college's students more necessary than analyses that were more student development oriented. Over half of the respondents indicated that analyses of the county demographic profile, market share information, enrollment projections, student profiles, and the student satisfaction survey were "very" necessary. These are analyses that are likely to be used by persons in administrative areas for planning, both fiscal and programmatic. The only analysis rated "not at all" necessary by more than half of the respondents was course pass rates.

Extended Learning and Workforce Development

Table 5: Mean Necessity Ratings – Extended Learning

Item	Mean
Extended Learning enrollment trends	4.88
Annual unduplicated headcount analysis	4.29
Trends in student curriculum choices	4.14
Enrollment by ZIP code	4.00
Distance Learning student profiles	4.00
Student customer satisfaction surveys	4.00
Credit-free student profile	3.86
Carroll County demographics	3.38
Fall trends in enrollment by discipline	3.14
Term-to-term retention analysis	2.86
Market shares – residents	2.71
Market shares – high school grads	2.71
Transitional student enrollment trends	2.71
Course pass rates	2.43
Graduate job placement analysis	2.43
Graduate Follow-Up survey findings	2.43
Fall credit student profile	2.29
Spring credit student profile	2.29
Winter credit student profile	2.29
Summer credit student profile	2.29
Credit enrollment projections	2.14
Graduation/transfer rate analysis	2.00
Transfer destinations	1.86
Transfer performance at 4 year colleges	1.86
Degrees and certificates awarded	1.71
Financial aid by type, # of recipients	1.57

Note: n =7 or 8 for every item

The variety of responses and the small number of Extended Learning and Workforce Development respondents makes interpretation of their preferences for presentation of the analyses somewhat challenging. In most cases no respondents indicated that they wanted paper reports. However, respondents still expressed a desire for reports which was equal to or greater than their desire for electronic presentations in several instances: credit-free student profile, extended learning enrollment trends, distance learning student profiles, trends in student curriculum choices, and fall trends in enrollment by discipline. Respondents did not express a clear preference for web presentation of the analyses over e-mail. Perhaps this is due to the smaller number of respondents.

Extended Learning and Workforce Development respondents rated a variety of information about the college overall as necessary (see Table 5). Each of the following had mean ratings of necessity of 4.0 or higher: Extended Learning enrollment trends, annual unduplicated headcount analysis, trends in curriculum choices, enrollment by ZIP code, distance learning student profiles, and student customer satisfaction surveys.

Why Conduct an Information Needs Assessment?

Administering an information needs assessment can fulfill multiple purposes. First, it may provide an informal introduction of a new researcher and the IR function to the institution. In the case of Carroll Community College, the needs assessment was the first piece of official correspondence sent from the Coordinator of Institutional Research to the entire college community. It not only increased awareness of the new IR office but also of the types of information the office was capable of providing. Especially if an institution has had no formal IR office, faculty and staff may not know what types of information may be available to them and a needs assessment can provide examples of standard reports and analyses.

Next, a needs assessment can communicate the area's willingness to be responsive to the needs of the institution. Many faculty and staff members may not realize that the new researcher is available for their use, not just to supply information to the President and other executive decision makers. While college executives may be the primary consumers of information, it is important to communicate the researcher's availability to the entire community. In the case of Carroll Community College, the needs assessment opened lines of communication between many faculty and staff members and the IR office. Some returned the survey in person so that they could discuss their needs as they turned in the survey. Others commented on how nice it was to be asked about the types of data they needed.

Finally an information needs assessment collects data which can be used to prioritize IR tasks beyond mandated reporting. It provides the researcher with a sense of what types of information are important to members of the college or university community. Especially when analyzed separately for the smaller groups which comprise the institution, the results of the needs assessment can be a valuable guide to planning the implementation of analyses and reports. The results of the Information Needs Assessment at Carroll gave the IR office a guide for where to focus its efforts and provided evidence of the need for a formal IR function on campus. This type of evidence can be used when lobbying for additional staff or other resources.

Acknowledgements

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THE DEVELOPMENT OF A FRESHMAN EXPERIENCE SURVEY

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Background

The Association of Independent Colleges and Universities of Pennsylvania (AICUP) represents 79 of the 92 accredited non-profit independent 2- and 4-year colleges and universities in Pennsylvania. It is the second largest state association of independent institutions in the United States. One of the functions of AICUP is to help its members to assess their performance by providing them with various forms of information regarding their own institution and with comparative information regarding their AICUP peers.

In 1995, AICUP developed the Sophomore Survey. This survey was administered to sophomores but asked mainly about their prior freshman year activities. In 1998, the AICUP Research Center undertook an evaluation of the Sophomore Survey, to ensure that the instrument remained maximally useful and met the current needs of the AICUP membership. A working group was seated, consisting of ten institutional representatives. These representatives included institutional researchers, deans of students/academic affairs, and others involved with freshman issues on campus.

The working group identified three main goals for the survey revision. The first was to focus the instrument more directly on the freshman year and to ensure that the survey assessed the areas of primary concern for institutions regarding their freshman classes. The second goal was to incorporate linkages with other major surveys commonly used to assess students at various other points in their degree program. Third, it was deemed important that the survey design and administration allow for an examination of factors that affect students' decisions about whether to continue to the sophomore year. This goal was derived from research that has found that the majority of attrition occurs between the freshman and sophomore years (e.g., Smith, 1998[1]). Steps taken to achieve each goal are described below.

Survey Content Focus

In order to focus more directly on the freshman experience, a list of potential issues was generated by the working group, based the pragmatic concerns of AICUP's member institutions and the literature on factors affecting student learning and success. This list was then boiled down to four areas of primary concern for the institutions: academic advising effectiveness, preparation for first year classes, skills assessment, and students' overall impressions of the institution and their first year. The latter included assessing satisfaction, expectations versus experiences, and information regarding students' intentions to stay, transfer, or drop out.

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[1] In a study of 232 institutions, 22% attrition was observed between first and second year, and 11% between 2nd and 3rd year.

The decision was also made to administer the survey to freshmen at the end of the year, rather than to beginning sophomore students. This would ensure that all freshmen were surveyed rather than only those who persisted to their second year, thus providing a more representative sample and allowing an examination of factors affecting their retention (the third goal of the survey redesign). The survey name was also changed to the Freshman Experience Survey (FES) to reflect its new focus.

Linkages

Many of AICUP's members were interested in tracking student change over time, and one way to do this was to link items on the FES to items on other surveys conducted at different points in the students' undergraduate careers. Given the content areas of the FES, and in an attempt to select surveys commonly used by AICUP members, three "target" surveys were selected for linkages: the CIRP Freshman and College Student Surveys (CSS) and the HEDS Senior Survey (SS) (see note[2] below for information on each).

One or two items from each target survey were selected to be included in the FES. The items were not repeated in their entirety. Rather, the wording of the question and the rating scale were maintained but only a subset of the response stems were selected for inclusion. This helped to keep the length of the FES within desired parameters and allowed for the addition of several response stems that were of specific interest to the AICUP membership. For those interested, Table 1 provides a description of the linked FES items along with the corresponding target survey and item number in each case.

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[2] The CIRP (Cooperative Institutional Research Program) Freshman Survey assesses freshman students at the start of the year. The CIRP College Student Survey was introduced to follow-up the Freshman Survey. It is most commonly used as a senior survey, but can be administered to continuing students as well, at the institution's discretion. The HEDS (Higher Education Data Sharing) Consortium is moderately selective and national in scope, consisting of private institutions primarily liberal arts in nature. The HEDS Senior Survey is also used by AICUP.

Table 1. FES items and the corresponding survey of origin and item numbers.

FES section	FES item #	FES item description	Origin Survey	Origin Item #
IV	1A	Rate self on traits as compared to the average person your age.	CIRP CSS	23
IV	1A	Rate self on traits as compared to the average person your age.	CIRP Freshman	26
IV	3	Time spent on various activities in a typical week.	CIRP CSS	16
IV	3	Time spent on various activities in a typical week.	CIRP Freshman	29[a]
VI	1	Satisfaction with various aspects of college.	HEDS SS	11

[a] The wording is slightly different on the CIRP Freshman survey as it asks about their last year of high school.

Retention Information

To assess retention, two changes were made to the survey and its administration. First, two items were added to the FES, that asked about students' plans regarding whether to return for their sophomore year or to do otherwise (Section VI, items 4 & 5). Second, participants in the study are asked to provide a list of returning sophomores in the fall of the following academic year. This information will then be used to flag the respondents as having persisted or not, allowing participants to examine differences in responses as a function of this variable.

Field-test

In the spring of 1999 a field-test of the draft instrument was conducted. Fourteen of AICUP's 2- and 4-year institutions volunteered for the study. The participant institutions varied in size and mission.

Each institution was asked to administer the FES to between six and twelve freshmen (though some administered it to more or less). In addition to simply completing the survey, special instructions were created for the field-test that asked respondents to also act as evaluators of the instrument. They were instructed to note on the survey itself any items that were confusing, unclear, or otherwise problematically worded. Respondents were also asked to indicate whether there were any topics not found on the survey that they felt ought to be included, or any items that were irrelevant to their experience and should be omitted. A separate sheet was included for these open-ended responses, on which students were also asked to indicate how long the survey took to fill out.

The feedback from the field-test was extremely informative. It yielded several minor changes in item wording and the deletion of several items with a high degree of overlap. A substantial proportion of respondents also indicated that they felt the survey would be improved with the inclusion of items to assess their transition from high school to college/university, and the institution's efforts to help with that adjustment. In response, a section was added to the FES (Section V) for this purpose. Items for this section were selected in part based on surveys from Wilke's University and Carnegie Mellon University. To obtain a copy of the Freshman Experience instrument, please contact the authors directly.

Administration issue: Collecting identifying information.

A challenging issue highlighted by the field-test was that of how best to collect identifying information from respondents. The addition of linkages to other surveys and the collection of retention information necessitated the collection of such information from students. In the field test, participants were asked their name and social security number directly on the first page of the survey. However, a meaningful number of respondents refused to provide this information. Others questioned why such information was needed if responses truly were confidential as we had claimed. Still others stated that they believed that people would not respond honestly if required to identify themselves - a well-documented problem in self-report research.

After consulting with various institutional researchers and those who would be involved in the survey's administration at the institution level, the current form of the FES was created. The informed consent/instructions preceding the survey were first changed to clarify that no individual responses would be reported, and that identifying information was collected only in order to link the respondents' data to their responses on other surveys on campus. An item was also added asking respondents whether they wanted to release their identifying information to their home institution or have it masked. In both cases, the wording was modeled after that of the CIRP surveys.

Lastly, the identifying information was removed from Section I (Background) of the survey and instead put on a separate cover sheet along with a repeated informed consent statement. This cover page and subsequent survey pages were numbered, with each institution to be given a block of numbers (to help identify institutions with surveys for data entry). In this way, the identifying information can be stored separately from the surveys, and can be included in the administration of the survey at each institution's discretion.

Summary and Conclusions

The process of evaluating and redesigning the new Freshman Experience Survey took slightly longer than expected – just under a year. It involved getting input and feedback from a variety of constituents: the working group, Research Center liaisons (consisting mainly IR professionals) at all the AICUP institutions, and the AICUP Research Committee (the governing body of the Research Center who must give final approval to all surveys). However, we feel that the resulting instrument meets the goals set out by the working group, assessing the freshman experience while focussing on the needs of the

AICUP membership.

The field-test of the instrument was extremely beneficial. It revealed ambiguities and omissions made by the developers and permitted substantial improvement in the instrument. Although time-consuming and requiring additional resources, we found that the benefits outweighed the costs, and therefore strongly recommend it.

Lastly, we feel that the addition of retention information and the ability to link responses to other major student surveys represents substantial value-added for the survey as compared to its previous iteration. However, these benefits must be weighed against the concurrent and not minor complication of having to collect identifying information from respondents. The latter can have serious implications for response rates and response validity.

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ABOVE THE BOTTOM LINE:
ASSESSING ACADEMIC THROUGH-PUT BY MEANS OF AGGREGATE COURSE HOUR ANALYSIS

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Introduction

At the heart of this paper is the humble credit hour - a unit critical to the almost every aspect of college institutional function and college student career, yet strangely under-utilized as a tool for higher educational research and assessment. Currently, the Educational Resources Information Center lists in its database over 1,200 documents keyed to the phrase "credit hours", but the overwhelming majority turn out to be institutional fact books, third week table collections or the result of brief mentions in research reports focusing on something else. The few exceptions where credit hour measurement formed an important component in study methodology tended to be practical and narrow-focused: faculty workload analysis (Dutton & Hutchinson, 1982; Kojaku & Zrebiec, 1983; Yankosky, 1995), college and departmental funding analysis (Macomb County Community College, 1976; Tilton & Turrisi, 1978; Bresler, 1980; Sharp, 1995), student performance analysis (Aronson, 1980; Khouj et al., 1982), and comparative program analysis (Kroll & Cooper, 1988). The only referenced study we could find exploiting credit hour measurement at anywhere near its full research potential was that of Campbell and Doan (1982), which placed credit hour enrollment near the center of a planning and budgeting model.

The purpose here is broader: To stimulate interest in credit hour measurement for its potential *general utility* as a supplement to standard approaches of institutional fiscal and student outcomes assessment. One important reason why credit hour phenomena are under-studied is that the credit unit is so ubiquitous in academia that it is normally taken for granted. Thus it tends to fall, so to speak, beneath the radar of educational analysts looking for a researchable topic. But the credit hour's very ubiquity is a sign of its profound value. It functions both as the common convertible currency of college finance and as the common token of college mission - knowledge transmitted and received. The other important reason for credit hour under-appreciation is our contemporary culture's obsession with *the bottom line*. In academic assessment, this has meant a narrow emphasis on institutional income/outgo totals and student graduation/dropout rates, often to the exclusion of identifying and understanding the factors leading to these bottom lines. Certainly, credit hour aggregates show up, in the end, as prime terms in the calculation of both types of statistics. But the most interesting and telling aspects of credit hour phenomena take place *above the bottom line*. This happens in the ways that the formal mechanism of the academic process interacts with student choices and performance to produce academic through-put expressible as different types and amounts of credit hour accumulation.

Methodology

The body of this paper is the presentation of six examples of how aggregate course hour analysis can enhance the results of financial and outcomes assessment at higher educational providers. All of the examples relate to the state of affairs at Prince George's Community College, although in principle the techniques they embody should be workable at other community colleges and even at four-year institutions, once allowances are made for local variances in student record set-up and administrative policy regarding student progress toward academic program completion. Some of the analytic categories may have to undergo minor changes in definition, and the actual category numbers, of course, will turn out differently, but the underlying logic will remain the same.

Creation of the examples required the compiling of a special data set representing an entering cohort of PGCC students - specifically, all those enrolling at the college for the first time during the Summer or the Fall of 1992 and attending classes in the fall semester (N=4,063). This included both new native students (first college enrollment anywhere) and those transferring in from other higher educational institutions. Cohort data was used because it provided the most direct path to cumulative course hour statistics which were more or less directly comparable across all cases. The "more or less" qualification is necessary here due to the inclusion of non-native students, who by definition would have gotten a course-taking jump new native students. Their inclusion was justified on the grounds that only a full entering cohort view of credit enrollments could provide financial officers with a complete picture of the sources of student-derived revenues. This consideration seemed to trump that of absolute equity in start of native course-taking, especially since investigation revealed only a small empirical untidiness resulting from transfer student inclusion - just 30 percent of non-native entrants brought *any* prior earned credits with them to PGCC. Circumstances at other schools, of course, may not permit this sort of methodological compromise. In any case, several of our assessment techniques (in particular, those relating to outcomes assessment) did not involve analysis of non-native aggregate credit hours. Besides the full cohort, the inclusion of data filters gave us the capability of separately analyzing a sub-cohort consisting only of native students in degree or certificate programs (N=1,746), and another, styled after Student-Right-to-Know (SRTK) cohorts, which dropped all but first fall full-time students in associate degree programs (N=805).

The freeze point used in assessment illustrations was end of semester, Spring 1998, marking the end of the cohort's sixth year of existence and also of its effective life-span (95 percent of all cohort member academic outcomes decided), Thus, for all intents and purposes, our evaluations represented final assessments, fitting in with the general illustrative nature of this paper. Given the term-by-term organization of the database, however, we could have chosen any number of alternative freeze points - for example, end of semester, Spring 1995, defining a three year interval equaling the "150 Percent of Normal" assessment cut preferred by many oversight agencies.

Lastly, there was the matter of the core content of the database. Assembling the analysis file turned out to involve considerably more than just rounding up all of the student record system data elements with the term "cumulative hours" in their labels. First, an analytic scheme identifying all assessment-relevant types of course hours had to be developed (transfer student imported hours, native student concurrent hours at other schools, hours from audits, from class withdrawals and incompletes, remedial program CEUs, etc.). Second, all college policies bearing on credit accumulation had to be pinned down with exactitude (for example, the fact that credits earned in one semester might be expunged in a subsequent term due to a change in degree program). Third, in light of the first two steps it became abundantly clear that nothing short of a pain-staking term-by-term recasting of the student record data would allow us to calculate the course hour sums appropriate to our analysis. After a considerable programming effort, we managed to construct a database tracking cohort progress by assessment scheme categories across all 24 major and summer terms of the six year assessment interval, in such a fashion that all course hour six year sums could be taken in any form or combination required by the study by hours attempted or earned, raw or administratively adjusted, major term- or summer term-derived.

Financial Assessment Examples

The first three illustrations demonstrate how aggregate hour analysis can deepen college financial assessment efforts. From a fiscal point of view, the name of the game is not helping students advance toward their academic goals (credits earned) but filling class room seats. Therefore, the proper unit of analysis in this case is the *attempted course hour* (regular credit hours plus remedial CEUs). Probably not atypical of community colleges generally. In recent years PGCC's student-related income (tuition, fees and state operational reimbursement) has amounted to over 70 percent of total institutional revenues, all pegged directly to course hour sums (total per course hour charges and state funding according to numbers of full-time equivalent students). Table 1 provides a post-mortem overview of the full cohort's attempted course hour accumulation.

According to the table, by Year Six cohort members had taken at least 124,046 hours worth of college courses. Not all of these, however, were state fundable or otherwise resulted in revenue for PGCC. Non-native course hours attempted by PGCC students, the revenue from which flowed to other schools, accounted for nearly 8 percent of the total. This, actually, is a conservative estimate since no precise data was available on non-native credits attempted, and therefore numbers of non-native credit hours *earned and accepted* by PGCC (usually considerably less than all hours earned or attempted at other schools) had to be substituted.

Accordingly, the overwhelming majority of non-native hours turn out to be derived from transfer student importation (8,290). Only 1,196 hours (a mere 1 percent of all attempted hours) resulted from native student concurrent enrollment elsewhere. PGCC shares its service area with three other higher educational providers, and college administrators have long wondered whether a significant level of concurrent enrollment was taking place to the detriment of our budget. The answer, as the table data attest, is clearly negative. On the other hand, over a third of our entrants started course-taking before they arrived at PGCC, and our 8 percent estimate of course hour attempts lost to the college (and a very conservative estimate it is) does suggests a notable detrimental revenue effect.

Table 1. 1992 Fall New Entrants (N=4,063):
Anatomy of Six Year Enrollment Course Hour Totals

Type of Course Hours	Hour Sub-Total	% Total Hours	Hours/ Student
All Course Hours C *Native & Non-Native*[1]	*124,046*	*100.0 %*	*30.5*
All Native Course Hours *(Fundable)*	114,560	92.3 %	28.2
All Non-Native Course Hours *(Non-Fund.)*	9,486	7.6 %	2.3
▸ Accepted Transfer Student Credits	8,290	6.7 %	5.8*
▸ Accepted Native Student Credits	1,196	1.0 %	.5*
All Native Course Hours	*114,560*	*100.0 %*	*28.2*
Non-Standard Course Hours	28,038	24.5 %	6.9
▸ Developmental (including ESOL)	13,227	11.5 %	3.3
▸ Ungraded Credit (including W, I)	14,811	12.9 %	3.7
• Audited Enrollments	1,002	1.1 %	.3
• Withdrawals/Incompletes	13,791	12.0 %	3.4
Standard Credit Hours (Graded Credit)	86,522	75.5 %	21.3
▸ Earned Credit Hours	76,256	66.6 %	18.8
▸ Failure to Convert	10,266	9.0 %	2.5
Native Summer Term Course Hours	6,937	6.1 %	1.7
▸ Developmental Enrollment	496	.4 %	.1
▸ Ungraded Credit Enrollment	574	.5 %	.1
▸ Standard Credit Enrollment	5,867	5.1 %	1.4

[1] Both raw credit and developmental non-credit course enrollment regardless of type of term (Major or Summer), plus raw PGCC-accepted credit hours. Raw hours means hours unadjusted for course repeating, special waivers, degree program modifications or articulation agreement changes.

* By students within entry category: Non-Native = 1,428, Native = 2,635

The total number of *native* course hours generated in the six years of the cohort's life was 114,560, all income-yielding. Of these, 13,277 (near 12 percent) proved to be state-fundable non-credit units (CEUs) produced by developmental and ESOL course-taking. Over a third (34 percent) of cohort members placed into remedial programs and, whatever academic headaches this may have caused *them* in terms of delayed credit course-taking and other problems, it would appear that fundable non-credit programs are relatively lucrative for the college. This, of course, is the short-term view, for low developmental program completion rates spell eventual loses of revenue on the credit enrollment side. On the other hand, one wonders whether many these students, unremediated, could have persisted in degree programs anyhow, so on balance the college probably wins financially.

The great bulk of money-bearing course hour attempts, of course, were on the credit hour side - 101,333 (88 percent). Around 13 percent involved non-graded course-taking. Only a handful of hours were generated by course audits (1,002) but a very substantial number (13,791) resulted from aborted study efforts (post-third week withdrawals without prejudice and uncompleted courses not resulting in a failed grade). As in the developmental case, both of these circumstances may have been deleterious to student academic advancement but contributed significantly to college coffers.

Credit attempts leading to a course grade came to 86,522 (76 percent), the biggest single major category in Table 1. Failed credit attempts represented just under 10 percent of all native course hours, while a full two-thirds (67 percent) resulted in a passing mark and earned credit. The last portion of Table 1 singles out cohort summed course hour attempts which occurred during the summer months only 6,937 (6 percent). Given the accelerated program potential here for part-time students (over two-thirds of the cohort), this may indicate an important under-utilization of summer term time and thus an unrealized budgetary opportunity.

Table 2 shifts our assessment focus from the descriptive to the prescriptive. It embodies one approach to answering the "so what" questions always posed of institutional researchers by college administrators – "Where's the leverage here?" and "How should we channel our energies to make improvements in this picture?" The table shows a series of hour-based pair group comparisons. Each pair represented an important opposition of academic status or behavior (e.g., native vs. transfer, full-time vs. part-time). The table displays each pair group's cohort student percentage, percent of all native course hours, per student course hour rate, and two ratio scores. The *indexed rate* represents the raw group rate in terms of the common cohort rate, indicating group rate deviation from the norm. The "worth" ratio, calculated by dividing rate of the course attempt-heavier group by that of the course attempt-lighter group, suggests how much more enrollment productive the former is compared with the latter.

Table 2. Full Cohort: Comparing Selected Source Group Course Hour Rates (N=4,063)

Criterion Groups	% of Cohort	% of Hours	Hours/ Student	Indexed Rate*	"Worth" Ratio
WHOLE COHORT	100.0 %	100.0 %	28.2	1.00	-
1st Year Retained	52.1 %	83.8 %	45.4	1.61	4.78
1st Year Dropout	47.9 %	16.2 %	9.5	.34	
Mostly Day Classes	70.0 %	89.8 %	36.2	1.28	3.77
Mostly Evening Classes	30.0 %	10.2 %	9.6	.34	
Assoc. Degree Program	78.0 %	89.3 %	32.3	1.23	2.36
Other/No Program	22.0 %	10.7 %	13.7	.52	
Full-Time Load 1st Semester	32.0 %	51.8 %	45.7	1.62	2.28
Part-Time Load	68.0 %	48.2 %	20.0	.71	
Completed Dev Programs[a]	10.1 %	22.7 %	63.1	2.24	2.02
Incomplete Dev. Work[a]	24.2 %	26.8 %	31.3	1.11	
Passing Cum GPA (2.0+)	64.0 %	75.4 %	33.2	1.18	1.72
Failing Cum GPA (<2.0)	36.0 %	24.6 %	19.3	.68	
First-Time Entrant	64.9 %	74.3 %	32.3	1.15	1.57
Transfer-In Student	35.1 %	25.7 %	20.6	.73	
Sequential Terms Only[b]	21.3 %	38.9 %	51.5	1.83	1.25
1+ Major Term Stopouts[b]	30.8 %	44.9 %	41.2	1.46	

a. Data for non-developmental students not shown nor used in calculations
b. Data for first year retained students only; dropout data not used in calculations

Since demonstration of assessment technique is our purpose, we will restrict our remarks concerning the findings displayed to how that can be used in the effective communication of assessment results. Reviewing implications of the worth ratios for just two group pairs will suffice for this purpose. Thus, given the data, it would be legitimate for us to inform PGCC administrators that the average student who makes it through his or her first year and continues into the second *is worth close to five dropouts* in terms of revenue-bearing course hour attempts. Similarly, one could relate that the typical full-time student *is more than equal to two part-time students*. We chose these two pairs deliberately because their table statistics bear directly on controversy current at our college - whether scarce resources for college advancement would be better spent on recruitment efforts to increase student body headcount or rather put into programs fostering the retention and course load upgrading of students already enrolled. The table makes it obvious that the biggest fiscal pay-off (and, coincidentally, also the biggest graduation rate pay-off) lies in the latter strategy.

Table 3. Regression “Guesstimates” of Potential Cohort Course Hour Change

Equation	R^2	Std. Error	F Change	df1	df10	Sig. F Change
y=Native Course Hours	.641	16.24	804.95	9	4053	.000
Independent Variables[a]	Unwtd b	β	Y Est.[b]	% of Hours	Change Guesst.[c]	% Change[d]
Retention beyond Year 1	22.563	.416	47,743	41.7	43,930	138.3
Mostly Day Sessions	8.957	.152	25,474	22.2	10,919	109.5
Passing Cum. GPA	7.516	.133	19,542	17.1	10,996	109.6
Full-Time Load Fall 1	14.234	.245	18,490	16.1	39,343	134.3
Associate Degree Prog.	4.164	.064	13,204	11.5	3,714	103.2
First-Time Students	3.695	.065	9,736	8.5	5,276	104.6
Dev. Programs Finished	20.976	.234	8,642	7.5	*20,640*	118.0
Non-Dev. Student	2.705	.047	7,214	6.3	3,776	103.3
No Stopouts post-Year 1	5.769	.087	4,990	4.4	*7,217*	106.3
[CONSTANT]	-9.963	-	40,480	-35.3	-	-
Total	-	-	114,560	100.0	145,812	227.3

a. All independent variables are dichotomies with values 0/1 where 1 indicates presence of quality

b. Unweighted b x Number of Cases value=1

c. Unweighted b x Number of Cases value=0 (italicized figures represent estimates using special logically defined subsamples: non-completing developmental students and first year retained student with stopouts)

d. (Add-on estimated yield + total course hours) / total course hours

There are, however, a few drawbacks in the Table 1 approach to conveying the implications of course hour analysis. First, from a methodological angle, the student body is unrealistically represented as a medley of many discrete, independent divisions, whereas any quantitative analyst worth his or her statistics degree knows that reliable findings for multivariate data can only arise out of an analysis method which takes the effects of multidimensional interaction effects into account. Second, and more important in many presentation contexts, the worth ratio is a bit abstract and somewhat lacking in pizzazz.

Using a multivariate model of course hour generation with "What If" capabilities instead might solve both problems. Upon altering plug-in values, the model would produce "guesstimates" of the results which readily translate into the language of policy makers. Although statistical purists may scorn "What If" models (for them, changing equation terms always means changing equation form) but to do policy planning without such tools is to fall back upon hunches, anecdotal information and the sort of ad-hoc empiricism represented by worth ratios. When used judiciously and with all due caution, "What If" models can provide a fair sense of how the world works and where human effort might best prove effectual. What must be avoided at all cost, however, is the presentation of their findings as *actual prediction*. "Guesstimates" are not gospel prophecy, just helpful probes of an elusive future made through appropriate data and good math guided (hopefully) by commonsense.

In constructing the "What If" model embedded in Table 3, we took the simplest, most straight-forward road - multivariate linear regression. The model's dependent variable was cohort member cumulative native course hours, while the independent variables entered into the regression analysis were presence (1) or absence (0) in nine different course hour source groups. Technically, the model performed very well (R^2=.64). Beta weights suggest that first year retention (β=.42) had the greatest direct effect by far, followed distantly by first fall course load (β=.25) and developmental program completion (β=.23), while the impact of day session attendance, which looked so important in Table 2, fell to mid-level under statistical controls (β=.15). Also interesting here were some of the unweighted coefficients (representing the worth of a membership in raw course hour units, unadjusted for the negative constant). Particularly notable was that of developmental completion; membership in this group turned out to have a course hours worth nearly equal that of first year retention, a fact masked in the beta results by the small number of members.

More important for our purposes, though, were the guesstimate values, which represent *something like* what *might be* realized in additional course hour totals if *all students* could be induced to join a particular successful category. How might they be used to tell the assessment story? Imagine, for example, the impact of the following statement based on the retention-all cases=1 guesstimate of +43,930: It is conceivable that course hour enrollments would increase by around 40,000 if a 100 percent student first year survival rate could be obtained! Or: Research suggests that for each 10 percent reduction in the dropout rate, we stand a chance to add another 4 percent to our fundable course hours. Administrative interest in retention efforts would be certain to skyrocket. Neither would the researcher who said these things be telling lies - not exactly. It would be more like the propagation of a useful myths embodying a deep truth, about the retention's great impact on course enrollments and the high likelihood of material fiscal benefit through more institutional effort spent this area.

Outcome Assessment Examples

The last three examples to be presented zero in on the usefulness of aggregate course hour analysis for student outcome assessment. In this case, the basic gauge is the *earned credit hour*, a unit which can be interpreted either as set distance traveled toward a degree or other academic award, or as standard measure of personal educational accomplishment, learning for its own sake. In the former sense, the one which inspirits most outcomes assessment currently, the ultimate expression of earned credit accumulation is taken to be graduation. Table 4 follows the progressive reduction of cohort collective course hours from the largest and logically most inclusive category (total native and non-native course hours) to the smallest and most assessment-salient category (total award earner credit hours). Its main purpose is to help in the identification of those intermediate stages where hour "loss" is most significant. To eliminate any confusion resulting from the inclusion of transfer and non-program students, the analysis was restricted to the sub-cohort consisting only of native, program-enrolled student (N=1,746).

Table 4. Native Award-Seeking Entrants (N=1,746): Course Hours to Earned Credits

Type of Course Hours	Hour Total Process Effects	% Total Hours
SOURCE HOURS		
All Native Course Hours	+ 62,076	+ 98.6 %
All Non-Native Course Hours	+ 863	+ 1.4 %
All Course Hours - Native & Non-Native[a]	***62,939***	***100.0 %***
NON-STANDARD COURSE HOURS	- 16,102	- 25.5 %
▸ Developmental (including ESOL)	- 8,124	- 12.9 %
▸ Ungraded Credit (including W,I)	- 7,978	- 12.6 %
» Audited Enrollments	- 96	- .2 %
» Withdrawals/Incompletes	- 7,830	- 12.4 %
Standard Credit Hours Attempted (Graded)	***46,837***	***74.4 %***
FAILURE TO CONVERT TO EARNED HOURS	- 7,137	- 11.3 %
• Course Performance Loss[b]	- 6,135	- 9.7 %
• Official Adjustment Loss[c]	- 1,002	- 1.6 %

Official Credit Hours Earned	*39,698*	*63.1 %*
FAILURE TO CONVERT TO AWARD	- 30,670	- 48.8 %
• Transfer without Award	- 9,178	- 14.6 %
• Part-Time No Award or Transfer	- 10,851	- 17.2 %
• Full-Time No Award or Transfer	- 10,641	- 16.9 %
Award Earner Credit Hours	***9,028***	***14.3 %***

a. Both raw credit and developmental non-credit course enrollment regardless of type of term (Major or Summer), plus raw PGCC-accepted credit hours. Raw hours means hours unadjusted for course repeating, special waivers, degree program modifications or articulation agreement changes.
b. Course grades under C
c. Mostly due to student program change

According to Table 4, the sub-cohort generated a total of 62,939 course hours over six years of study, which ultimately converted to only 9,028 graduating student earned credit hours (14 percent). Even so, this represented a marked improvement over the standard assessment finding that graduating members made up a mere 8 percent of all sub-cohort students. The single largest category shown not contributing to award attainment was credit earning failing to result in graduation (49 percent). Under this heading, dropping out before any standard academic goal was achieved accounted for most credit hour "loss" (over a third - 34 percent), but transferring without degree also material reduced graduation credit generation(15 percent). Other categories in playing negative roles were remedial program CEUs and ungraded course-taking (13 percent each). If the standard, however, is relaxed to a comparison of simple cumulative earned credit hours with all course hours, the assessment is considerable brighter, though far from brilliant: The six year attempted -hours-to-earned-hours *conversion rate* for PGCC 1992 native entrants pursuing degrees turned out to be .63.

Table 5 presents a somewhat different, benchmarked approach to hour-based outcomes assessment. Arguably, the most logical way to go about judging whether a discovered level of hour-based academic success is good, bad or indifferent is to compare it against a benchmark representing the total number of official earned credits a cohort needs, given cohort member degree program requirements, for 100 percent graduation. Establishing such a benchmark value is a relatively easy matter of summing the degree program credit hour requirements for all cohort members. The only stipulation that has to be made is that only *initial* associate degree program figures are used (or first certificate program/vocational letter-of-recognition figures if no degree program was attempted) in order to prevent multiple program enrollment from inflating the estimate (one student, working on his third associate degree, managed to accumulate 120 credits over the six years assessed!).

Table 5 shows total earned credit hours for the full cohort and SRTK sub-cohort benchmarked against credit hours needed for 100 percent cohort graduation. The full cohort had to generate at least 217,287 earned credit hours for each and every student to achieve his or her associate degree, vocation certificate or letter-of-recognition goal. How well did the cohort do? That depends on how one evaluates the following: Students earning their award contributed just less than 3 percent to the needed credit hour total (2 percent were credit hours beyond award requirements - in a sense wastage), students making some progress towards their awards but falling short contributed another 34 percent, leaving 63 percent of the total needed credits ungenerated. The situation for the SRTK sub-cohort, all native, full-time degree-seekers and the federal standard assessment group, was a bit better, but not by much. Here, students earning degrees represented close to 5 percent of the needed credit hours, ungraduated students showing some degree progress accounted for another 43 percent, and still missing a residuum of unrealized credit hours representing 53 percent of the benchmark.

Table 5. Summary Cohort Credit Hour Outcomes by End of Sixth Year

Outcome Indicator	Total Cohort Credit Hours	% of All Needed
Total Cohort (N=4,063)		
Credit Hours Needed for 100 % Graduation[a]	217,287	100.0 %
Sufficient Credit Hours (*Award Attained*)[b]	6,082	2.8 %
• Over Point of Need	3,741	1.7 %
• At Point of Need	2,341	1.1 %
Insufficient Credit Hours (*Award Progress*)[b]	74,577	34.3 %
Unrealized Needed Hours (*No Progress*)[c]	136,628	62.9 %
Non-Program Students (*Award-Irrelevant*)	3,112	-
SRTK Cohort (N=805)		
Credit Hours Needed for 100 % Graduation[a]	51,052	100.0 %
Sufficient Credit Hours (*Degree Attained*)[b]	2,354	4.6 %
• Over Point of Need	1,143	2.2 %
• At Point of Need	1,211	2.4 %
Insufficient Credit Hours (*Degree Progress*)[b]	21,810	42.7 %
Unrealized Needed Hours (*No Progress*)[c]	26,888	52.7 %

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a. Total credit hours required by all student degree programs
b. Native and non-native official credit hours
c. Unearned remainder of total cohort needed credit hours

The final example is an exercise in using cohort credit hour data to enhance outcomes assessment at the conventional individual student level of analysis. Table 6 begins by providing the SRTK cohort's six year graduation rate, the same as would be logged in the college's IPEDS-GRS reporting - 10 percent. This, however, may be compared to the cohort percentage represented by all students, whether or not they actually were awarded associate degrees, with earned credit accumulations at or above those of their degree programs. Surprisingly, this turned out to be a substantially higher 16 percent. In other words, 6 percent of cohort students apparently qualified for degrees they never took or received - the discovery of an important and dismaying mystery, for had they all graduated PGCC's federally reportable six-year rate regarding this cohort would have been 55 percent higher. Adding students whose success was registered by transfer to a four-year program and school (26 percent of the cohort in their own right) improved the positive outcome rate to 33 percent (a group consisting of overlapping actual graduates, degree qualifiers and transfer-out students). Lowering the "success bar," if we add the 9 percent of the cohort who fell just one semester (15 credits) short of degree qualification after six years of study, the success rate nudges up to 37 percent. And let us not forget students with sophomore status (30 or more official credits earned). These made up nearly 46 percent of the cohort. Including them in the success group pushed its percentage almost to just short of 50 percent. Finally, reverting to the aggregate level one more time, there is the outcome measure we call "graduate equivalent units." Modeled on FTE, the number of GEs in a cohort is simply the total assessment period number of official earned credits divided the mean degree program credit requirement. Applied to the Fall 1992 SRTK cohort, this turned out to be 372, 46 percent of the cohort were these true students. The new credit hour-based outcome measures vary considerably in usefulness and respectability potential, but all are defensible from some assessment angle and all have something to teach about the whys and wherefores of institutional performance.

Table 6. 1992 SRTK Cohort Official Six Year Student Outcomes along with Possible Indicators based on Cumulative Credit Hours

Outcome Indicator	Category % of Cohort	Category Student n	Cum. Joint % (Success)	Added n
Actual Associate Degree Graduates	10.2 %	82	10.2 %	82
Official Credit Graduate Equivalents[a]	15.8 %	127	15.8 %	45
Actual Transfers[b]	25.7 %	207	33.3 %	141
Students within 1 Semester of Degree[c]	8.8 %	71	36.8 %	28
Official Credit Sophomores[d]	45.5 %	366	49.4 %	102
Total	-	805	100.0 %	805
"Graduate Equivalent Students"[e]	46.2 %	372	-	-

a. Students with official credits equaling or exceeding program credit maximum
b. State-Tracked transfers to state-related four-year schools plus other transfers identified by the National Student Loan Clearinghouse
c. Students 15 or fewer official credit hours short of degree program maximum
d. Students with official credits equaling or exceeding 30 hours
e. Cohort aggregate official earned credits (24,164) / mean degree program credit requirement (65)

Conclusions

The body of this paper was wholly concerned with the nitty-gritty of assessment, so in seems time in our concluding remarks to make some more general observation regarding current assessment practice, especially as it bears on evaluating study outcomes. Today's assessment "bottom line" practice discounts of all program advancement except that eventuating in degree attainment, and in the community college case where the majority of student successes fall into the category of "transfer without degree", also leaving a prime variety of institutional accomplishment without any acknowledgment. Not only does this seem to us to be technically deficient on its face, it appears foolhardy during an age seeing dramatic growth in the proportion of students pursuing degrees multi-institutionally. Adelman (1999), for example, reports that majority of degree-attainers now graduate from a school other than the one first attended. Increasingly, colleges and universities are becoming partial, sequential co-contributors of degree-related credit hours, and thus co-credentializers of graduates. Single institution outcomes assessment will shortly become meaningless in the day fast approaching when multi-institutional higher educational careers are commonplace and only the last in a string of schools get to hand over a diploma. Like the Julian calendar and chronologic time, standard assessment practices are destined to fall farther and farther behind the educational seasons of the new millennium. In the meantime, more attention should be given outcomes indicators which anticipate this trend, and aggregate credit-based measures are the natural candidates.

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* Bracket codes are ERIC reference numbers

WHAT'S IN A NAME CHANGE?
USING CIRP DATA AT A TRANSITIONAL TWO-YEAR COLLEGE

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In 1989, Williamsport Area Community College merged with Penn State and became Pennsylvania College of Technology. Beside the change in name and institutional control, opportunities arose for new programs and services (e.g. bachelor degrees, on-campus housing, athletics). However, the College mission remained essentially the same. With the Penn State connection, has Penn College begun to attract different types of students, and if so, in what ways do they differ?

Objectives

Penn College periodically assesses its entering students, for five basic purposes:

1) describe what they look like;
2) analyze how they differ from national norms;
3) analyze how they differ from those entering in the past;
4) analyze how student sub-groups differ, and
5) establish a basis for measuring student change and development.

The College is currently conducting a longitudinal study to address the latter objective. This paper focuses on part three, but will incorporate pieces of one and two to provide additional insight. To study entering students, Penn College participates in the Cooperative Institutional Research Program (CIRP) entering student survey.

Literature Review

The CIRP Entering Student Survey, sponsored by the American Council on Education and the Higher Education Research Institute at UCLA, is part of the largest continuing study of American higher education. CIRP involves some quarter million students every year (Astin, 1993). Obviously, Penn College is not the only college interested in studying entering students. College-going populations are constantly changing: more adults are entering, more minorities and more part-timers (Levine, 1989). Students are becoming more disengaged, academically and politically (Sax, Astin, Korn & Mahoney, 1997). Peer groups are among the most potent developmental influences on students (Astin, 1993; Pascarella & Terenzini, 1991). Thus, faculty and staff need to understand these new students not just individually, but as a whole.

The primary purpose of CIRP is to assess the effects of college on students (Astin, Panos & Creager, 1966). In order to do so, colleges must first profile students at the time they enter college. The entering student survey provides this initial profile, on a wide array of characteristics. For participating colleges, CIRP also provides opportunities to make useful internal and external comparisons. Penn College has participated twelve times, including five times since the 1989 merger.

The 1997 national norms highlight several trends regarding the changing family structure of college students, and their growing academic and political disengagement (Sax et al., 1997). Students are coming from smaller families: those with less than four dependents reached a high of 51%, compared to a low of 33% in 1978. Perhaps related, a record high 26% of all freshmen came from single-parent homes, nearly triple that reported in 1972. With the corresponding growth in single parents, fewer mothers (11%) than ever are full-time homemakers, compared to 34% in 1976. While all three of these trends are also evident among the general American population, the rate of change among the families of students is even greater (U. S. Census Bureau, 1997).

The 1997 entering class also show "higher levels of disengagement-both academically and politically-than any previous entering class" (Sax et al., 1997, p. 2). Record high proportions were: bored in class (36%, compared to low of 26% in 1985); over-slept and missed class or an appointment (35%, nearly double the low in 1968), and studied less than six hours a week (66%, compared to low of 56% in 1987). Despite this decline in study time, students express loftier educational goals and expectations. Over half aspire to a graduate degree and expect at least a B average (compared to lows of 33% in 1972). Nearly 20% expect to graduate with honors (compared to low of 4% in 1968).

Student political disengagement is evident in even more ways. Record lows are keeping up to date with politics, discuss politics, hope to influence politics, or vote in student elections. Similarly, student interest in environmental, multicultural, community and social activism has declined to ten-year lows, after peaking in 1992. Do Penn College students reflect the same trends? Are they moving closer to national norms?

Methodology

Population/Sample: The CIRP entering student survey targets first-time, full-time students. *First-time* students are those enrolling in higher education for the first time ever. Penn College, like most colleges, defines *full-time* as 12 or more credit hours per semester. The entering College population in the 1990s has ranged from 1200 to 1500 students. Since the merger, freshmen studies were conducted in 1989, 1990, 1992, 1995 and 1997. The first three years, students were surveyed in-class, producing samples of over 60% (1989 – 1036, 1990 – 1042, 1992 - 895). The last two years, they were surveyed during orientation, producing samples under 30% (1995 – 468, 1997 - 360).

Response rates were analyzed by academic school, sex, age, race, and father's and mother's education. Younger students have been routinely over-represented. In 1997, adults responded at a significantly lower rate (11%) than did traditional-aged students (31%). Thus, results summarized here should be considered representative only of the traditional-aged student body. This is an acknowledged limitation of the study.

It is also important to recognize that these results apply only to full-time students. While the College part-time enrollment has been slowly declining, they still represent between 20% to 25% of all Penn College students. Part-time students differ from full-timers in many substantial ways.

Data Sources: The CIRP Student Information Form (SIF) has been developed by CIRP project staff, together with students, participating institutions, government agencies, professional associations, educational researchers, administrators, and members of the CIRP Advisory Committee. It is designed for self-administration under proctored conditions. For a copy of the instrument and more details, refer to Sax et al. (1997).

CIRP produces national norms for a number of institutional classifications. As a two-year college that now also offers B.S. programs, Penn College is interested in public two-year and four-year comparative norms. ***Public 4-year colleges*** consist of publicly controlled (local, state or federal) institutions that primarily offer baccalaureate programs, but not doctorates. ***Public 2-year colleges*** consist of publicly controlled institutions that primarily offer sub-baccalaureate programs.

Data Collection: In 1989, 1990 and 1992, College faculty administered CIRP during the first week of classes in sections selected by the Institutional Research office, in coordination with academic school offices. This gave high response rates, but over-sampled students in the more rigidly structured technical majors and under-sampled those in the more flexible non-technical majors. It also took an hour of class instruction time.

In 1995, Student Services administered CIRP, in coordination with IR staff, in several classroom orientation sessions. Due to low response rates, in 1997 IR staff administered CIRP directly for the first time, in a single large orientation session. Unfortunately, the result was an even lower response rate. In both years, an additional small number of students were surveyed in classrooms at the College's North Campus in Wellsboro. The reduced sample sizes in 1995 and 1997 constitute further limitations of the study.

Data Analysis: The final phase of this study will involve multivariate longitudinal analyses of student development based on CIRP data. This phase however, focuses on more simplistic comparative analyses. Thus, bivariate methods were deemed sufficient. CIRP provides a voluminous number of variables, most of which are either ordinal or categorical. To simplify the analyses, chi-square tests were the primary method used. This conservative approach fails to take full advantage of the ordinal format of some variables. However, there was no shortage of significant findings even without making optimal use of the type of variables available. Significant chi-square findings were followed up with residual analyses as needed.

This paper primarily focuses on comparing Penn College entering students over time. Chi-square tests of homogeneity (Daniel, 1978) were conducted to test the null hypotheses ($p_{1997} = p_{1989}$) against the alternative hypothesis that the 1997 population differs from 1989 (or 1990, 1992, 1995). Chi-square goodness-of-fit tests were used to test the hypotheses that the 1997 College sample differs from the national 2-year and 4-year norms. However, these results are used only where they provide further insight toward this paper's main objective. All statistical tests used 5% significance levels.

Results

National norm comparisons: To lay a foundation for discussing changes in Penn College entering classes, it will be useful to briefly summarize (see Table 1) how they differ from national norms. Due to space limitations, test statistics are not included here.

Compared to four-year college norms, Penn College attracts significantly more adults, lower-income students, and lower-achieving students (i.e. high school grades). Perhaps related to their disadvantaged backgrounds, they have lower self-esteem and interest in most aspects of the educational experience. They are more likely to indulge in cigarettes and beer. For many, Penn College is the only institution they even considered attending.

Compared to both two-year and four-year norms, Penn College attracts significantly fewer female and minority students. Furthermore, they are much less likely to have even socialized with members of other ethnic groups. Their parents more likely work in blue-collar occupations, and come from an extended geographic base that is particularly uncommon for two-year colleges. Their college finances depend much more heavily on government aid and loans. They are more firm in their career goals and expectations, and are primarily focused on education as a means to a high-paying job. Community and cultural goals and values are of relatively little interest to them. They are also less politically involved and more conservative than most students are (Cunningham, 1999). Many of these traits have carried over from the institution's community college days. But has there been any shift in student characteristics since the merger?

Demographics: Before looking at more CIRP data, it is better to examine some of the demographic items routinely collected for administrative purposes (age, sex, race, income, major, etc.). Penn College summarizes five years of enrollment data in the annual *Sourcebook* (1998) report. The most substantial demographic shift has been in student age (see Table 2). More traditional-aged (under 21) students are entering (80%), particularly since 1992 (74%). In contrast, the adult (over 20) segment has dropped from 26% in 1992 to 21%. Related to age, the male majority has grown from 56% in 1992 to 60% (the College's traditional aged students have always been predominantly male).

The age bias in the CIRP sample, combined with the substantial age shift in the underlying population can complicate analyses of the results. To clarify the age complications, the proportion of younger students taking the CIRP was much higher in 1997 than in the past. In part this was due to a *true* increase in the proportion of traditional incoming students, but in part it was due to response bias (younger students were more likely to respond).

Table 1
1997 Entering Students
Penn College vs. National Norms

Variable	Penn Clg	Public 2-yr	Public 4-yr
Female	.40	$\boxed{.52}$	$\boxed{.56}$
Age 21+	.20	.09	$\boxed{.01}$
Minority (non-white)	.04	$\boxed{.17}$	$\boxed{.24}$
Socialize w/person of other ethnicity (frequently)	.39	$\boxed{.54}$	$\boxed{.64}$
Father: skilled-unskilled labor	.34	$\boxed{.22}$	$\boxed{.17}$
Family income <$50k	.55	.59	$\boxed{.48}$
H.S. GPA B or lower	.86	.87	$\boxed{.68}$
Academic ability >average (self-assessed)	.30	.33	$\boxed{.58}$
Intellectual self-confidence	.41	.41	$\boxed{.55}$
Smoke cigarettes (frequently)	.28	.25	$\boxed{.13}$
Drink beer (occasionally)	.58	.57	$\boxed{.49}$
Politics–Far right	.031	$\boxed{.015}$	$\boxed{.015}$
Politics–Liberal	.12	$\boxed{.19}$	$\boxed{.21}$
Applied to other colleges	.48	.44	$\boxed{.72}$
Attending 1st choice college	.80	$\boxed{.68}$	$\boxed{.67}$
College aid-family ($1500+)	.59	$\boxed{.30}$	$\boxed{.50}$
College aid-summer work	.54	$\boxed{.35}$	.49
College aid-on-campus job	.09	.09	$\boxed{.20}$
College aid-off-campus job (pt)	.22	$\boxed{.34}$	.24
College aid-college scholarship	.10	.13	$\boxed{.25}$
Expect to change career choice	.02	$\boxed{.10}$	$\boxed{.12}$
Goal-successful business owner	.51	.45	$\boxed{.40}$

NOTE: Statistically significant differences are enclosed in rectangles.

In terms of academic major, B.S. programs have produced nearly all the enrollment growth (95 to 165) in the past two years, up 75%. One- and two-year programs have

In terms of academic major, B.S. programs have produced nearly all the enrollment growth (95 to 165) in the past two years, up 75%. One- and two-year programs have slightly declined. This change also relates to student age (younger students are nearly twice as likely to select B. S. majors).

While Penn College students continue to come from families of lower educational and occupational status, their backgrounds are increasingly stable. First, in contrast to national trends, more Penn College students' parents are living together. Fewer (21%, down from 26% in 1992) are from broken homes, now below national norms (also 26%).

Perhaps related, the income gap between Penn College students and national norms is closing. The proportion from families earning over $50,000 has jumped from 27% in 1992 to 46%. In contrast, the lower-income segment (under $30,000) has dropped from 45% to 25%, nearly matching national norms. The down side to this improved financial stability is that it probably also reflects the reduced access lower income students have to the College, because of skyrocketing tuition rates.

Probably also related to income, Penn College students are coming from an increasingly disperse geographic area (lower income students tend to stay close to home). Over half of the entering students came from over 100 miles away, compared to 28% in 1990, and now significantly greater than national norms (39%).

Table 2
Penn College Entering Students - Demographics
1992 vs. 1997

Variable	National Norm	PC 1992	PC 1997	Chi-Square	p-value
Age <20	.94	.74	.80	NA	NA
Age 20+	.06	.26	.20	NA	NA
Female	.54	.44	.40	NA	NA
Parents live together	.70	.67	.76	32.5	<.01
Family income $50k +	.53	.27	.45	155.1	.03
Family income $10k - $30k	.18	.34	.17	155.1	<.01
College 100+ miles from home	.39	.32	.54	116.2	<.01

Academic preparation: The College is attracting a somewhat better prepared student body. The proportion with average high school grades of B+ or better has nearly doubled since 1989, from 18% to 34%. In addition, entering student self-perceptions of intellectual self-confidence (*41% - 31%*) are *significantly higher than prior classes.*

Activities: Since 1989, more entering students have performed volunteer work (69% - 48%). In contrast, they are spending less time drinking (beer, 73% - 58%; wine/ liquor, 60% - 52%) and partying (75% - 83%).

Table 3
Penn College Entering Students – Academics & Activities
1989 vs. 1997

Variable	National Norm	PC 1989	PC 1997	Chi-Square	p-value
H.S. grades B+ or higher	.51	.17	.33	88.4	<.01
Intellectual self-confidence >average	.54	.31	.41	3.9	.05
Performed volunteer work	.73	.48	.69	7.4	.01
Drank beer	.53	.75	.58	7.0	.01
Drank wine/liquor	.56	.62	.52	4.6	.04
Partying-at least some time every week	.82	.83	.75	4.7	.04

Socio-political views: While most Penn College students politically align themselves with neither the left nor right, those who do are increasingly conservative. Since President Clinton was first elected in 1992, entering students have become significantly less likely to support liberal views, such as:

- the federal government is not adequately controlling environmental pollution (75%, down from 86%, norm 82%);
- abortion should remain legal (46%, down from 63%, norm 54%), and
- a national health care plan is needed (67%, down from 79%, norm 73%).

Table 4
Penn College Entering Students – Socio-Political Views
1992 vs. 1997

Variable	National Norm	PC 1992	PC 1997	Chi-Square	p-value
Orientation – Conservative/far right	.21	.19	.22	19.2	.02
Orientation – Liberal	.22	.17	.12	19.2	.02
Fed gov't not controlling environment/ pollution	.81	.86	.75	4.2	.04
Abortion should be legal	.54	.63	.46	4.5	.04
National health care plan needed	.72	.79	.67	4.2	.01

College selection/finances: Penn College students apply (and are accepted) at fewer colleges than their peers, but this is changing. Since 1992 more College students have applied elsewhere (48% - 38%). They also have been more heavily dependent on college loans, but are now receiving greater family support (76% receive some support, up from 69%; 59% receive over $1500, up from 39% in 1992).

Table 5
Penn College Entering Students – College Selection & Finances
1992 vs. 1997

Variable	National Norm	PC 1992	PC 1997	Chi-Square	p-value
Applied to other colleges	.66	.38	.48	39.8	.02
College aid-family ($1500+)	.52	.40	.60	7.0	.01

Education/career expectations: Compared to 1989 more Penn College students expect to receive a bachelor's degree (35% - 21%). This is a natural result of increasing B. S. degree programs at the College. Probably related, fewer students expect to transfer to another college (9% - 5%).

Since Penn College began offering B.S. degrees, enrollment patterns have become more complex. Some students enter associate degree majors, but also intend to complete the B. S. at the College (or start in certificate programs, but intend to complete the associate). Others have no aspirations beyond the program they first enter. Some 5% even enter degree programs with no intent of actually graduating. Most (45%) still simply enter two-year programs with no plans for the B. S., but this group is in decline.

Enrollment growth has come primarily in B. S. majors. CIRP data shows an equally rapid growth in those who intend to receive a B. S. at the College, but first enter at the associate degree level (up from 16% to 26%). Thus, one in every four College freshmen might appear on the surface to be only two-year students, but they actually intend to stay for the four (or more) years it takes to complete their baccalaureate. This finding has obvious implications for both advising and future enrollment growth.

Conclusions

Since merging with Penn State, the Penn College entering population has slowly evolved. However, it still significantly differs from national norms in more ways than it mirrors the traditional population. Penn College students continue to bring a complex mix of two-year and four-year college student traits.

To summarize, in contrast to national trends, Penn College students are coming from more stable family backgrounds, and an increasingly disperse geographic area. They are entering with increasingly more conservative social and political views than their peers. They are reporting less partying and alcohol consumption. While their academic involvement remains low compared to their peers, they perceive the College's academic reputation to be slowly improving, in conjunction with improving levels of academic preparation, self-confidence and degree aspirations.

Implications: Penn College underwent a major transformation 10 years ago and enrollments continue to slowly evolve. The PSU connection has been beneficial, and may have helped increase the *quantity* of our enrollment. In addition, focusing only on internal enrollment trends, it may appear that student characteristics are substantially changing. However, in comparison to national norms, the change in entering student *qualities* has been relatively moderate.

Compared to prior entering classes, Penn College students are becoming more like traditional students – younger, from more stable families, with middle and upper class incomes, and improving academic backgrounds. However, compared to their peers, Penn College students continue to display far more non-traditional characteristics (e.g., age, family, education, career and financially oriented interests and goals). As Astin has recognized, there is considerable consistency in the kinds of student bodies enrolling at particular institutions, even over long periods of time (1985). It could be added that this consistency is likely to persist even through a period of substantial institutional transition.

For institutional researchers, this study also raises questions about how often we need to replicate some of our research efforts. In a decade of institutional upheaval, the pool of Penn College students is still more like those who came ten years ago, than they are to their peers. It may not be necessary to conduct studies like CIRP and analyze the results every year (or even five times over nine years). Given the ever-expanding demands for research information, could we better use our resources elsewhere?

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INSTITUTIONAL RESEARCHERS AS LEADERS IN POLICY: PERSPECTIVE AND POSSIBILITIES

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Introduction

Purpose. This paper presents the results of a research study that investigated institutional researchers' leadership role in higher education planning and policy. The paper focuses primarily on institutional researchers' effectiveness in influencing policy changes at their institution. The major research questions are:

- How effective are institutional researchers in influencing policy? and
- What factors make institutional researchers more effective in the policy arena?

Answers to these questions offer insights that can be used to enhance the effectiveness of all practicing institutional researchers. The study also documents institutional researchers' perspectives regarding job-related rewards; challenges encountered in seeking to establish influential roles in decision-making; and strategies utilized for coping with these challenges.

In the context of this study, effectiveness is based on participants' responses to the question, "Has your work effected program/policy changes at your institution?" Those who reported that their work 'often' or 'very frequently' effected program policy changes at their institution are classified as more effective, while those who reported that their work 'almost never', 'not often' or 'sometimes' effected program policy changes at their institution are classified as less effective.

Review of the Literature. Researchers in the field of higher education recognize the significance of policy effectiveness for the institutional research profession. In their study of perceptions of effectiveness, Knight, Moore and Coperthwaite (1997) found that institutional researchers were more likely to consider themselves to be effective if they possessed the following characteristics. They had been employed in the field for a greater number of years; held the doctorate; were associate directors of institutional research; and reported directly to the institution's president.

Sanford (1995) outlined four main challenges that institutional researchers need to address to ensure success in tomorrow's academic environment: adaptability to change, access to data with modern technology, better comparative data, and the policy analysis / technology resource dilemma. Keller (1995) contends that institutional researchers will need to work closely with administrators and provide information about trends, social changes and regional conditions. He claims that superior academic management will be more closely tied than ever to quality institutional research.

During the last decade, several researchers have recommended changes to ensure that institutional researchers will be effective in policy development. For example, Matier, Sidle, and Hurst (1994) advocate expanding the scope of institutional research to encompass the roles of information architect, change agent and consultant of choice within higher education institutions. Delaney (1997) recommends enhancing the capacity for conducting complex research studies; creating and supporting high-level audiences for institutional research studies; and expanding the focus of institutional research studies to include relevant factors and external trends. Lohmann (1998) proposes that institutional researchers become competent in policy debate; develop a power base; increase the level of environmental scanning; participate in the strategic planning process; and shift studies from mere reporting to timely research on pressing issues.

Methodology

Data Source. Data for this study are based on results from a mailed survey sent to 304 members of the Northeast Association for Institutional Research; 221 returned completed surveys yielding a response rate of 73 percent. The respondent group reflects the demographic, educational and professional diversity of the institutional research profession. Of the 221 respondents, 41 percent are male and 59 percent are female; 40 percent possess a doctorate; 42 percent have a master's degree; and 18 percent hold a bachelor's degree. Respondents represent a range of professional positions. Eleven percent hold titles at the level of dean to vice-president; 50 percent are directors; 10 percent are associates; 16 percent are analysts, coordinators or mangers; and 13 percent describe their role as assistants or research and technical specialists.

Participants represent a range of experience in institutional research from less then one year to 28 years; the mean and median number of years are 9 and 8 respectively. With regard to type of institution, 33 percent have spent most of their career at a university, 28 percent at a four-year college, and 15 percent at a two-year college. The largest proportion, 29 percent have worked primarily at a public institution compared with 25 percent at a private, non-religious institution and 15 percent at a private religious institution.

Analytical Techniques. Both qualitative and quantitative techniques were employed in the data analysis. The quantitative techniques included Chi-square, t-tests, correlation and discriminant function analyses. Chi-square analyses examined variation in perceived policy effectiveness by gender, current professional position, level of education and type of institution. The t-tests were utilized to investigate relationships between perceived effectiveness in policy and variation in job rewards, job challenges, leadership experience, desire for enhanced skills and mentor experience. Discriminant analysis was conducted to identify predictors of perceived effectiveness in policy.

Results

Role in Policy. In describing their roles within the institutions, 47 percent of the institutional researchers in this study reported they 'often' or 'very frequently' serve on planning and policy committees. Approximately one-third or more 'often' or 'very frequently' present their work at executive level meetings; collaborate with others in program development and initiate discussions on program planning and policy. However, only 28 percent are 'often' or 'very frequently' consulted on impending policy changes, and only 12 percent 'often' or 'very frequently' conduct follow-up studies on the impact of their work.

With respect to the use and influence of their work, 86 and 72 percent respectively reported that their work 'often' or 'very frequently' is disseminated at the vice presidential and presidential levels and is used in executive decision-making. However, only 31 percent reported that their work 'often' or 'very frequently' includes policy recommendations. Finally, regarding the primary focus of this paper, only 49 percent reported that their work 'often' or 'very frequently' has effected program/policy changes.

Correlation analyses were conducted to investigate the relationship between characteristics of institutional researchers, their practice and effectiveness in influencing policy. The two strongest correlates are: work is used in executive decision-making ($r = .72$, $p \leq .001$) and research reports include policy recommendations ($r = .51$, $p \leq .001$). Next in order, institutional researchers conduct follow-up studies on the impact of their work ($r = .48$, $p \leq .001$) and work is disseminated at the vice-presidential or presidential level ($r = .48$, $p \leq .001$). Also significant is the fact that more effective institutional researchers experience challenging leadership opportunities in their current position ($r = .37$, $p \leq .001$).

T-test analyses were also conducted to identify significant differences between more and less effective institutional researchers both in the roles they assume and in the use of their work at their institution. These differences are displayed in Table 1. In terms of roles, more effective institutional researches are more frequently consulted on impending policy changes; present their work at executive meetings; and conduct follow-up studies on the impact of their work. In addition, the work of the more effective institutional researchers more frequently includes policy recommendations and is more frequently disseminated and used at executive levels within the institution.

Table 1
Significant Differences in Roles Assumed by More and Less Effective Institutional Researchers

	Means			
Role	**More**	**Less**	**Difference**	**t Ratio**
Are consulted on policy changes	3.36	2.44	.92	5.94***
Present work at executive meetings	3.53	2.66	.87	5.12***
Conduct follow-up studies	2.85	2.00	.85	6.18***
Collaborate in program development	3.37	2.60	.77	5.20***
Serve on planning and policy committees	3.87	3.10	.77	4.48***
Initiate discussion on planning and policy	3.10	2.38	.72	4.31***
Use of Work				
Work used in executive decisions	4.64	3.51	1.13	12.08***
Work includes policy recommendations	3.44	2.41	1.03	6.85***
Work disseminated at executive level	4.80	4.14	.66	6.18***

Chi-square analyses examined the relationships between institutional researchers' personal and professional characteristics and their effectiveness in policy. Variables examined include gender, level of education, current position, and type of institution in which they have spent most of their career. Results revealed only one significant relationship - between level of education and effectiveness in policy ($X^2 = 6.40, p \leq .05$). Researchers with more education were more effective in influencing program/policy changes. Some 58 percent of those with a doctorate, compared with 47 percent of the master's degree and 34 percent of the bachelor's degree respondents reported their work 'often' or 'very frequently' has effected program/policy changes at their institution.

Rewarding Aspects of Work. In addition to focusing on effectiveness in policy, the study also explored institutional researchers' perspectives on the rewards and challenges they experience in their work. Results from this phase of the study identify professional independence in conducting research as one of the most rewarding aspects of an institutional researcher's job. Ninety-four and 88 percent respectively report they 'often' or 'very frequently' are able to work on their own and have the freedom to decide how to do their work. Between 60 and 81 percent 'often' or 'very frequently' are able to make decisions on their own; have the flexibility to set their own work priorities, and have the authority needed to get the job done.

Results from this research indicate that work rewards associated with independence differ significantly for more and less effective institutional researchers. As shown in Table 2, more effective institutional researchers have more independent authority to hire persons of their own choice. In addition, they have more authority to spend their budget, to set their research agenda, and to do what is necessary to get the job done. They also have more freedom to work on their own and to accept or reject superior's suggestions and they receive more financial support for professional development.

Table 2
Job Rewards of More and Less Effective Institutional Researchers

	Means			
Job Rewards	**More**	**Less**	**Difference**	**t Ratio**
Independent authority to hire	3.20	2.36	.84	3.90***
Authority to spend budget	3.71	3.21	.50	2.40*
Authority to get the job done	4.20	3.79	.41	3.47***
Authority to set research agenda	3.75	3.36	.39	2.56**
Can reject superior's suggestions	3.18	2.80	.38	2.87**
Budget for professional development	3.91	3.54	.37	2.38*
Being able to work on one's own	4.67	4.45	.22	2.63**

Leadership Experience. Since leadership qualities influence the extent to which individuals can effect change, this study also explored institutional researchers' perceived potential, preparation and support for their leadership role. Participants in this study were asked to rate themselves, their education, professional associations, and the support they received with respect to developing their leadership role. Some 30 and 21 percent respectively rated themselves 'Excellent' in terms of their leadership potential and effectiveness as a leader when given the opportunity. With regard to support for their leadership role, 'Excellent' ratings ranged from 21 to 30 percent respectively for the support received from male superiors and from female subordinates. Only 19 percent reported 'Excellent' ratings for leadership opportunities in their current position. Even fewer, 13 percent, gave 'Excellent' ratings for leadership development through professional associations.

As illustrated in Table 3, more and less effective institutional researchers differ significantly on four leadership variables. In terms of self-ratings, more effective institutional researchers report higher ratings for their own potential as leaders and for their effectiveness as leaders when given the opportunity. Further, more effective institutional researchers rate their current position higher in terms of leadership opportunities and they offer higher ratings for the support received for their leadership role from male subordinates.

Table 3
Differences in Leadership Potential and Experience of More and Less Effective Institutional Researchers

	Means			
Leadership Variable	**More**	**Less**	**Difference**	**t Ratio**
Leadership opportunities	3.76	3.36	.40	2.72**
Your potential as a leader	4.23	3.85	.38	3.56***
Support from male subordinates	4.03	3.70	.33	2.12*
Effectiveness as a leader	4.23	3.96	.27	3.43***

Challenging Professional Opportunities. When asked to what extent their current position provides challenging opportunities in various areas, 60 percent of the study participants reported 'very much' for computer technology, followed by 41 percent for intellectual reasoning, 33 percent for both research design and statistical analysis and 27 percent for higher education policy. In contrast, only 20 percent or fewer reported that their current position offered 'very much' of a challenge in the areas of leadership, management and training opportunities in research.

Comparative analyses identified statistically significant differences between more and less effective institutional researchers in the extent to which they experienced various challenging opportunities in their current position. These differences are documented in Table 4. As shown, more effective institutional researchers report more challenging opportunities in leadership, higher education policy, and management, as well as in intellectual reasoning, research design and statistical analysis.

Table 4
Significant Differences in Challenging Opportunities of More and Less Effective Institutional Research

	Means			
Challenging Opportunity	**More**	**Less**	**Difference**	**t Ratio**
Leadership	3.75	3.13	.62	4.36***
Higher education policy	3.97	3.42	.55	3.76***
Management	3.81	3.28	.53	3.75***
Research design	3.99	3.57	.42	2.80**
Statistical analysis	4.02	3.67	.35	2.42*
Intellectual reasoning	4.34	4.01	.33	2.97**
Training opportunities in research	3.16	2.83	.33	2.02*

Interest in Skill Development. When asked to identify the skills they would like to develop, 56 and 48 percent respectively expressed interest in developing their statistical and technological skills. Next in order, 38 percent expressed an interest in enhancing their leadership skills and 37 reported an interest in developing their skills in each of the following areas: analysis, budget and research knowledge.

Chi-square analyses identified a statistically significant difference between more and less effective institutional researchers in terms of one skill enhancement area - analytical skills. A higher 60 percent of the less effective, compared with only 40 percent of the more effective, institutional researchers expressed an interest in developing their analytical skills ($X^2 = 4.20$, $p \leq .05$).

Resources and Strategies for Success. The study also explored what resources and strategies institutional researchers use to overcome obstacles and achieve professional success. The vast majority, 78 percent, reported they have had a mentor. Sixty-six percent have sought other professionals in similar positions to advise them, and 59 percent have a strong professional network. The majority reported that their mentors 'frequently' or 'almost always' engaged in the following activities: communicating - listening and responding; motivating and encouraging growth; advising on substantive work issues; role modeling, and validating. No statistically significant differences were found between policy effectiveness and the role of mentors.

Statistically significant differences were found between policy effectiveness and institutional researchers' initiative in seeking out other professionals to advise them ($X^2 = 8.23$, $p \leq .05$) and involvement in a strong network of other professionals ($X^2 = 8.47$, $p \leq .05$). Sixty-eight percent of the more effective, compared with only 53 percent of the less effective institutional researchers, report they sought both male and female professionals to advise them. Similarly, 67 percent of the more effective, compared with only 49 percent of the less effective institutional researchers, reported that they were part of a strong network of female and male professionals. These results indicate that more effective institutional researchers reach out to and rely on a network of support from both male and female colleagues.

Predictors of Policy Effectiveness. Discriminant analysis was employed to determine which combination of variables would predict institutional researchers' effectiveness in influencing policy. Table 5 displays the results from this analysis. The discriminant function coefficients indicate the relative weights for each of the variables found to be significant predictors of effectiveness.

Table 5
Discriminant Analysis Results:
Predicting Policy Effectiveness in Institutional Research

Predictors	Standardized Discriminant Function Coefficients	Percent Correctly Classified
Work used in executive decision-making	.85	84%
Conduct follow-up studies on impact of work	.22	
Seek other professionals to advise	.14	
Hold a challenging professional position	.14	
Attain a high level of education	.10	
Work includes policy recommendations	.10	
Are part of a strong professional network	.02	
Canonical Correlation	.69	

$X^2 = 127.98$; 7 df; $p \leq .001$.

As shown in Table 5, the strongest predictor of policy effectiveness is that work is used in executive decision-making. Next in order are specific behaviors of institutional researchers including conducting follow-up studies on the impact of the work; seeking out other professionals for advice; and holding a challenging professional position. In this analysis, challenging professional position is based on a mean response to the question, "To what extent does your current position provide challenging opportunities in intellectual reasoning, leadership and management?" Including policy recommendations in one's work, attaining a high level of education; and being part of a strong network of professionals are also significant predictors of policy effectiveness.

These results indicate that institutional researchers who are able to introduce their work into executive decision-making and who take a pro-active role with respect to their own work are likely to be more successful in influencing program and policy changes. This pro-active role includes formulating policy recommendations based on research findings and conducting follow-up studies to determine if the research had any impact. Other academic and social factors also make a difference. Researchers who hold a doctorate and those who seek advice and support from other professionals are also more effective in influencing planning and policy.

The discriminant function including these seven variables accurately predicted the policy effectiveness of 84 percent of the respondents. The canonical correlation of .69

indicates that this function explains 48 percent of the variance in institutional researchers' effectiveness in influencing program and policy changes at their institution.

Discussion

Results from this research identify qualities of institutional researchers, characteristics of their positions, and specific professional behaviors significantly related to accomplishing institutional program and policy changes based on research. These results provide a framework for developing strategies to further enhance the policy role of individual institutional researchers and the institutional research profession.

This study confirms results from previous research that level of education has a significant impact on policy effectiveness. Bivariate and multivariate analyses revealed that institutional researchers with a doctorate reported significantly more often that their work had resulted in program or policy changes at their institution. Previously, Knight, Moore and Coperthwaite (1997) also discovered that institutional researchers with a doctorate were more likely to consider themselves to be effective. Delaney (1997) found the presence of an institutional research director with a doctorate to be significantly related to involvement in planning and policy development.

Findings from this study also revealed an interesting insight with regard to the relationship between policy effectiveness and how institutional researchers conduct their professional lives and their work. Institutional researchers who seek other professionals to advise them and who are part of a strong professional network report significantly more often that their work has achieved program and policy changes at their institution.

Finally, this study identified three professional behaviors significantly related to policy effectiveness. The first and strongest is that work is used in executive decision-making. This requires collaboration between the institutional researcher and the decision-makers. The other two behaviors are within the discretion of the institutional researcher - including policy recommendations in research reports and conducting follow-up studies on the impact of research studies.

The identification of these behavioral predictors of policy effectiveness supports the findings and recommendations of several previous researchers. Keller (1995) recommended that institutional researchers work more closely with administrators to realize successful management in tomorrow's academic environment. Matier, Sidle and Hurst (1994) advocated that institutional researchers become information architects, change agents and consultants of choice with higher education institutions. Lohmann (1998) proposed that institutional researchers become competent in policy debate, participate in the strategic planning process, and shift studies from mere reporting to timely research on critical issues. Results from this study support the validity of each of these recommendations and confirm their relevance to effectiveness in program planning and policy.

Conclusion

Findings from this study identify proven strategies for enriching institutional researchers' perspectives on their positions and enhancing the possibilities for success in influencing policy. Results show that institutional researchers who include policy recommendations in their reports; conduct follow-up studies on the impact of their work and whose work is used in executive decision-making are more effective in influencing policy. Having a doctorate and being part of a strong network of other professionals also enhance policy effectiveness. Further, institutional researchers who are successful in the policy arena find their positions challenging. These results suggest possible objectives and strategies that aspiring institutional researchers may follow to realize the possibilities of becoming influential leaders in policy development.

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PRE-COLLEGE CHARACTERISTICS AND FRESHMAN YEAR EXPERIENCES AS PREDICTORS OF 8-YEAR ACADEMIC OUTCOMES

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Abstract

This investigation examines twelve educational outcomes for a representative group of undergraduate students who began their freshman year in Fall 1990. Looking at these students in 1998, the study explores the association among pre-college characteristics, freshman year experiences, freshman year outcomes, and their cumulative 8-year college history. Results indicate that freshman college experiences are better predictors of all twelve outcomes than are the pre-college characteristics. In general, classroom experiences, faculty relations, and peer relations are the most influential predictors of subsequent outcomes.

Introduction[1]

This study is a continuation of previous outcomes research that has examined student outcomes such as intellectual growth, personal growth, satisfaction, persistence, and GPA. In this present analysis we combine data from the 1990 Entering Student Survey, the 1990-91 Freshman Outcomes Study, and the 1998 Student Information Records System. We then examine the associations among the pre-college characteristics, freshman year experiences, and long-term educational outcomes, including self-reported growth and objective performance records.

The Outcomes Assessment Model used at this university was developed over the years and draws upon the concepts and constructs in several other models discussed in the institutional research literature. The Office of Institutional Research regularly collects information that reflects the concepts in the model including an array of student personal traits, pre-college characteristics, and college experiences. Concepts concerning college experiences include student academic, social, and institutional integration, as well as academic and personal outcomes.

Using the model as a guide, we developed intellectual, personal, and overall growth measures from lists of specific skills self-reported by students concerning their own growth at the university on a 5-point scale. These growth measures, along with the other measures, form multi-item scales constructed by using a statistical reliability analysis which assesses how well each individual item fits in the particular scale or measurement.

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[1] Appendices referenced in this article may be obtained by contacting the authors.

This study looks at the factors influencing student outcomes measures but this time we focus on the freshman year as a predictor of subsequent multi-year outcomes. It is generally regarded that the freshman year is the most crucial in the typical student's academic career. Positive outcomes in the freshman year should be associated with positive educational outcomes such as those represented here by the 8-year college history.

The main question raised here is, what leads to positive outcomes in the Freshman year? Is it the pre-college characteristics that new students arrive at the University at Albany with? Is it the peer relationships that are established once students are here? Is it the faculty relations and classroom experiences while at college? Is it the effort students, themselves, put forth? The answer, we believe, can to some degree be found by studying the statistical relationships between the various pre-college characteristics, freshman year experiences, and desired growth and performance outcomes.

The second question is, which of these various pre-college and freshman year variables are most influential in predicting the more long term outcomes assessed here by the 8-year college history?

Data and Methods

Pre-college Variables

The 1990 Entering Student Survey was administered during summer registration to traditional freshmen entering the University in Fall 1990. The survey was developed over the years and it asks students about family socio-economic level, high school preparation, personal and academic interests, social concerns, academic skills, study habits, and future plans. Students respond to these questions on a 5-point Likert scale.

In addition to the 1990 Entering Student Survey data, information about the students' age, race, sex, high school GPA, and SAT scores is available from the Student Information Records System. Together, these two data sources give a picture of student pre-college characteristics.

Freshman Year Variables

The 1990-91 Freshman Outcomes Survey was also developed over the years. It was administered to freshmen in the Spring of 1991. The survey asks questions about family support, study habits, faculty and staff contact, social experiences, classroom experiences, academic plans, academic growth, personal growth, and satisfaction with the University. Student responses to these questions are also measured on a 5-point Likert scale and give a representation of freshman year experiences. The responses from the 1990 Freshman Cohort Study are linked by social security number to the student responses in the 1990 Entering Study Survey.

8-Year College Outcomes

Below is a brief description of the growth items from the 1990-91 Freshman Outcomes Survey and the 8-year performance outcomes from the Student Information Records System.

Intellectual growth items measure growth in the following areas:

Arts & Letters
Important literature, historical context, creative expression, original ideas, intellectual curiosity, and writing effectively.

Scientific Method
Problem solving, analytical thinking, scientific findings, mathematical concepts, and evaluating methods.

Disciplinary Skills
Schools, of thought, general principles, inter-relatedness of fields of study, synthesizing information, particular research methods, learning, and factual knowledge.

Personal growth items measure growth in the following areas:

Interpersonal Skills
Coping with conflict, team member, participation in democratic society, social skills, social situations, and speaking effectively.

Openness & Tolerance
Moral issues, cultural differences, new ideas, different races, understanding one's self, and new intellectual areas.

Responsibility & Self Control
Personal responsibility, self-discipline, and functioning independently.

Overall growth items measure growth in the following areas:

Goal Clarity
Clear goals, career plans, future intellectual and personal growth, academic achievement orientation, independent learning, career skills, future preparation, and graduate/professional school preparation.

Attend Albany Again
A single bottom line question asking students if they had to do things all over, would they attend University again.

8-year performance items measure outcomes in the following areas:

Credits

This is the number of credits the student has taken while at the University.

Departure Status

This is representation of whether students have dropped out, transferred, are still attending, or graduated.

Degree Completion

This is simply whether a degree has been obtained or not.

GPA

Final grade point average.

In addition to the growth measures and the "Attend all over Again" question, this study uses objective measures of student performance over an 8-year college history period. Data were obtained from the Student Information Records System regarding students' GPA, credits, departure status, and degrees obtained. This data, current as of Summer 1998, is linked by social security number to the student responses in the 1990 Freshman Cohort Study. Thus, altogether there are three linked data sets which collectively measure student pre-college characteristics, freshman year experiences, and 8-year college outcomes.

Factor analyses were used to help group the individual variables into conceptually sound multi-item scales which are then themselves treated as variables. The composition of the multi-item scales is listed in appendix B. The means and standard deviations for the student outcomes analyzed are listed in appendix C. The regression Beta weights and R^2 results from the analysis of student outcomes are listed in appendices D, E, and F.

Summary of Results

This analysis shows that college experiences are in general far more explanatory than pre-college characteristics in predicting student outcomes. The attached Chart (Appendix G) provides a visual summary of the relative importance of college experiences compared to pre-college characteristics. For 11 of 12 outcomes examined in this study, the college experiences in the aggregate are more influential than the pre-college measures.

Only for predicting cum GPA are pre-college measures in the aggregate superior to the freshman year experience measures. Moreover, there at least five outcomes (#credits, departure status, degree completion, attend the college all over again, and responsibility/self-control) for which the pre-college measures are not very good at all.

There is no instance in which a pre-college characteristic is the most important factor in determining any of the outcomes. It is what happens to students while they are in class, and their relations with faculty, that most influences their intellectual growth, goal clarity, and responsibility & self control. Students who have positive classroom experiences and positive relations with faculty are more likely to experience positive growth both academically and intellectually.

Classroom experiences and faculty relations also mix with student effort and conscientiousness to produce positive outcomes, not only for intellectual and personal growth outcomes but also for GPA and degree completion. Employment, however, appears to interfere with good educational outcomes. Employment is negatively related to credits, departure status, and degree completion. Employment may be a proxy for financial need and may contribute to an inability of students to focus more completely upon collegiate demands.

Peer relations is important. Growth in interpersonal skills and growth in attitudes of openness & tolerance are highly influenced by students' relationships with their peers. Their willingness to attend this college again also seems to be heavily reliant upon peer relations. Thus, good peer relationships are no doubt important to the overall college experience, but it is the classroom experience and faculty relations that most consistently contribute toward enriching academic experiences.

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ONLINE COURSES:
WHO'S TAKING THEM, WHY, AND ARE THEY SUCCESSFUL?

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While distance learning is not a new phenomenon, the growth of the internet and the subsequent growth of courses offered online have presented new challenges to institutions of higher education. Issues of access, quality, and cost are ones that many institutions of higher education are struggling with as they make decisions about whether to bring courses and programs online. In the spring of 1997 a group of CT colleges and universities formed the Connecticut Distance learning Consortium (CTDLC), applied for grant funding, and offered its first four classes in the spring of 1998. The Consortium now has 30 members and in the Spring of 1999 its members offered a total of 102 courses online. An assessment component has been part of this effort since the beginning.

Research into what makes successful online courses and successful online learners is still scarce. In a recent review of distance learning, Phipps and Merisotis (1999) examined much of the literature on distance learning published since 1990, but more of these studies examined the use of technologies other than the internet. One of the few studies of online learning using an experimental design (Schutte, 1997) found that students taking a class virtually as compared to in a classroom may in fact receive better grades in the class. However, many research questions, including whether certain students, certain classes, and/or certain pedagogies function better or the same as in the classroom, remain.

Access is also an important issue. Gladieux and Swail (1998) raise the important issue of whether this use of new technologies expands access or creates barriers to those students who are often underserved by institutions of higher education. Does the expense and lack of universally available technology make online classes the province of certain types of students?

This study, the beginning of a more extensive assessment of online learning, examined three major issues in online learning. It examined the demographics of students taking online courses. It asked why students chose online courses, whether they would do so again, and why. It also asked what factors in course design contributed to students' satisfaction and their belief that they had successfully completed the course objectives.

Method

Students taking online courses offered by the CTDLC member institutions were asked by their professors to go to a specific web address and fill out an anonymous survey, which had been piloted by students taking courses in the two previous semesters. The survey could be answered online and then sent electronically to the researcher. The survey contained 14 demographic questions which were answered by choosing and clicking on an appropriate response. Seventeen questions asking students to assess various aspects of the course were answered on a 5-point Likert scale. Four questions asked students about the organization of the class and the time commitment they made to it. There were also six open-ended questions about the organization of the class, what helped them learn effectively, why they took the course online, whether they would do so again, whether they would recommend online courses to others, and a space for final comments. The demographic questions were analyzed using frequencies, the Likert scales using means, and the open ended questions by analyzing common themes.

The survey was completed by 117 students who participated in 20 (approximately 20%) of the courses offered through seven of the Consortium members between January and July 1999. Table 1 shows the breakdown of these courses by type of college and the response rate of each, with a total response rate of 39%. This is a voluntary sample and is clearly limited by the fact that students who didn't finish the course, those most likely to be disenchanted by parts of it, did not fill out the survey. The courses offered at the 4-year private college were offered in an 8-week format. Those at the public institutions were offered in a semester format (generally 14 weeks) with the exception of one 5-week course offered during the summer by a 2-year public institution.

Table 1: Response rate

Type of College	Courses	Responded	Finished Course	Response Rate
4-yr private (1 institution)	8	60	168	36%
2-yr public (5 institutions	9	50	112	45%
4-yr public (1 institution	3	7	21	33%
TOTAL (7 institutions)	20	117	301	39%

Results

Demographics

The online students that responded to the survey are adults (Table 2: Age). They are predominately female (70%), white (95%), and with a few exceptions (9%) enrolled in a degree program. However, almost 18% of the students took a course at a college different from where they are enrolled as a degree student.

Table 2: Age

Age	Frequency	Percent	Valid Percent
18-24	15	12.8	13.5
25-34	34	29.1	30.6
35-44	46	39.3	41.4
45-54	16	13.7	14.4
Total	111	94.9	100
Missing	6	5.1	
Total	117	100	

Over 75% of those who responded are part-time students and over 80% of those who answered the question work full time. Only two students (less than two percent) live on campus. All the students are from within the United States, however 10% live outside of Connecticut.

Students primarily used a home computer (62%) to participate in the course, 11% used a work computer, and 24% used computers at a combination of sites. For most students (55.6%) this was the first course they had taken which was offered in any sort of distance learning format. However 41.9% had taken a previous distance learning course, and 35% had taken a previous online course. The major source of information used by the students to find out about the courses was the institution's written catalog (78%), with only 15% finding their information on the college's or CTDLC web sites.

Students' Evaluation of their Course

Students were asked to evaluate various aspects of the course they took using a five point Likert scale with five equal to strongly agree, four equal to agree, three equal to no opinion, two equal to disagree, and one equal to strongly disagree. Higher scores, therefore, represent a more positive evaluation of the course. Table 3 indicates that students are highly satisfied with the way their courses were designed and the teaching and learning that took place. However, it is important to remember that those students who withdrew from these classes did not complete these evaluations. If their withdrawal was due to dissatisfaction, that would not be reflected here. Areas of dissatisfaction are reflected in some of the student comments which are analyzed in the Comment section.

Table 3: Course Assessment

	Mean	SD
Learning outcomes/objectives were clearly stated	4.71	.60
Learning outcomes/objectives were achievable	4.64	.59
Course structure and requirements were clear	4.62	.67
Design of web pages was clear	4.58	.67
Course materials were available on time	4.69	.59
Required reading helped me achieve course objectives	4.67	.59
Links to other web sites were active when I needed them	4.34	.88
Interactions with instructor helped me learn	4.62	.73
Interactions with students helped me learn	3.99	1.14
Instructor was accessible to me	4.65	.65
Threaded discussion was important	4.22	1.12
Email was important	4.64	.80
The number of participants was appropriate	4.29	.94
Technological help was available when needed	4.26	.99
Equipment needed for the course was clearly stated	4.66	.79
Course technology was easy for me to learn and use	4.71	.60
Overall I am pleased I took this course on line	4.72	.61

The two questions concerning the value of interactions among students received the lowest mean scores and bear a closer look. Both the question on whether interactions with students helped the student learn and whether the threaded discussion was important received a total of 12% total disagreement. The first question had a large no opinion response of 16.2%. It is not clear whether these responses indicate that the class did not include or require student-to-student interaction, whether the instructor wasn't skilled at facilitating this type of discussion, or whether students didn't believe they learned from each other. The responses to the open-ended questions shed some light on this issue.

Students were asked some more general questions about the class, including the hours they spent on it as well as questions about the pace, intensity, and organization of the course. In response to the question about time spent on the course, students reported a mean of 9.85 hours, a median of 8 hours, and a mode of 10 hours. Just under 20% of the students reported spending 15 hours or more on the course.

Students were asked to compare the intensity of their online course to their face-to-face classroom courses. The results (Table 4) are almost equally divided by those who felt the class was more intense and those who felt it was of the same intensity. Very few students felt their courses were less intense.

Table 4: Intensity of online course

	Frequency	Percent	Valid Percent
More	58	49.6	50.9
Same	49	41.9	43
Less	7	6.0	6.1
Total	114	97.4	100
Missing	3	2.6	
Total	117	100	

Students were also asked about the pace of the course. Overwhelmingly (80% of those who responded to the question) felt the pace was appropriate. Three students (2.6%) thought the pace was too slow and 17.4% thought the pace was too fast. Most (88.7%) felt the organization of the course was appropriate; 10% thought it was too rigid; and one person felt it was too loose. Over 80% of those who responded to the question reported that the content, organization, and interactions helped them learn effectively; 18% reported that they helped partially, and no one reported that they didn't help. The general satisfaction with these online courses is reflected in the fact that 93% of the respondents would take another online course and 97% would recommend that others do so.

Responses to Open Ended Questions

Students were asked to respond to six open ended questions following their quantitative responses:

1. Comments about the pace, organization, and/or intensity of the course.
2. Comments about the organization and interactions of the course
3. Why they decided to take an online course
4. Why they would or wouldn't take another online course
5. Why they would or wouldn't recommend an online course to others
6. Final comments.

In general the comments reflect the positive views students have about online courses as was expressed in the quantitative section of the evaluation. However, concerns and negative views are also expressed. This range of comments provides amplification of the issues that are important to the online students who responded.[1]

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[1] The numbers in parenthesis at the end of each quote refer to the coded identification for each student who responded to the online survey.

Pace, organization, and/or intensity of the course

The majority of comments were positive comments and focused particularly on the instructor's role, both as a teacher and as a course designer. Student's were appreciative of faculty who were helpful, fair, flexible, and fun.

> *My instructor, assisted me in many ways which resulted in my really enjoying the on-line experience. I had never tried it before due to the intimidation and fear of not 'being in class' but this really opened up a more convenient but equivalent way to earn my degree.* (#11)

They relished a well taught class.

> *Absolutely brilliant teacher and a brilliant course. I so enjoyed it. There is little I could offer to improve upon it…I would like to add, (the instructor) is the epitome of the perfect online teacher. Man, did she make a challenging course fun and exciting…* (#24)

They appreciated a good course design.

> *…I think the class, materials, pace and organization were thought out and put together well. There was enough time between assignment to digest the information.* (#68)

However, even when students appreciated the organization and content, they often commented on the work load or the time commitment.

> *Organization was excellent. I felt it was an intense course which brought to light many issues I have overlooked for too long. The pace was adequate, however there were too many assignments…* (#44)

Students also found the pedagogy of their online course to be challenging and intellectually stimulating.

> *I felt more challenged to have my own answers to every question because I had to submit them for posting. In a traditional class it is possible to listen to others before some answers have to be given. In this course we are honor bound to finish our responses before reading what the other students had to say and I took that seriously* (#14)

The majority of concerns and criticisms were about workload, time commitments, and technology that got in the way. Comments such as, "For a student who has a full course load, this class seemed to require a large chunk of time. In order to keep up with deadlines the pace was fast." (#5) and "There was too much work per week." ((#38) were not uncommon. Some students felt that the additional time they spent on the course was beneficial.

> *…I learned a lot in the comfort of my own home. I believe that I spent more time working on this course. This is because I was working at my own pace when I had the time to spend rather than squeezing the class into my schedule.* (#15)

Finally, one or two instructors had attempted to use some types of collaborative or group learning experiences. Students reacted unfavorably to them either because they took even more time or because students were used to working at their own convenience and it was hard to coordinate with others.

> *The reading and other assignments were ok. The added collaborative projects and the research project took a long time to complete. The workload and the learning experience was great but the time involved to complete some of the other assignments other than the course work was more than I anticipated. On-line collaboratives are problematic.* (#98)

Organization and interactions of the course

Here again the positive comments outweighed the concerns and criticisms. Students commented positively on having clear deadlines, good course materials, clear organization, and interesting assignments. "Detailed lessons, homework, additional assignments were all outlined in detail. Instructor was available for help at all times" (#27). Students commented very favorably on courses which included good interaction with other students and with the instructor. Some students commented that this aspect of the online experience provided a better learning environment than a face to face class setting.

> *The interactions with the other students and teacher was a great help to me.* (#43)

> *Good reading material in relation to the segment of literature we were studying...Interesting reading all other students' ideas. Great getting active follow up from everyone, not just the teacher. Others brought new ideas to my understanding of the reading.* (p. 18)

> *...Many of the class members interacted quite frequently and challenged each other, much more than in a traditional classroom.* (#65)

> *...The course conference was great and you really felt as if you knew more about your classmates than in a traditional setting for the simple reason that everyone had a voice. You don't always get to hear other's viewpoints in a traditional class because the instructor is usually running the show, so this was great and much more educational.* (#81)

They had negative comments about courses which lacked clarity. "I had trouble understanding what was expected for each learning unit" (#48). There were many negative comments about courses which did not have meaningful interaction with either other students or with the instructor.

> *It would have been more helpful if there was more interaction between the students and the instructor. This might have spurred comments between students.* (#49)

> *I believe we needed more interaction with the instructor. Although the threaded discussions were good, there was little interaction with students. We all posted our comments, but there was little "conversation" among students.* (#102)

Why take an online course

Students were asked both why they took an online course and whether they would take another one. The responses to both these questions were similar and overwhelmingly reflect students' positive experience with their online course. The responses indicate that online classes provide these students with flexibility, convenience, and the ability to manage their own time. This is in spite of the fact that many students complained about the time commitment, workload, and pace. For some students the flexibility offered by online classes allowed them to take one or two more courses each semester than they might be able to if they had to drive to a campus and therefore accelerate progress through their program.

For a few students, taking a course online was an experiment to see if they would like it. Some students also believe that online learning provides them with a better learning experience than the classroom experience.

> *I would definitely do it again if the material is well distributed and assignments are as clear with the prompt responses and evaluations from the instructor—I really feel I have learned the most and in the most efficient manner with this experience.* (#82)

> *I enjoyed and understood the exercises more than going traditionally. This is due to you had to think about a problem when solving it, no one to help at a given moment in time. You just don't have the teacher present, cannot wait until the next class. You have to push yourself*. (#110)

Concerns about taking online courses revolved around technical problems, the expense (one institution charges more for its online course), and learning style. A few students very much missed face to face contact with other students.

Would they recommend an online course to others?

While the respondents would overwhelmingly recommend on line courses to others, and some already had, they were clear about the issues that confront online students. They believe that online classes require self-discipline, self-motivation and the ability to work independently. Many believe they require more work, but most acknowledge that the student controls the pace of work. Some commented that there are issues of isolation, but others believe they end up knowing more about their peers than they do in a classroom.

> *This kind of class structure is not good for everyone. Especially students who learn better in a group setting. This class structure requires a lot of self discipline and a strong ability to work and learn independently.* (#40)

> *I think you have to work harder than the traditional classroom—but you learn more and it is direct. The teacher tells you what is expected of you and that is (sic). I love it.* (#92)

Other respondents caution that online classes aren't for everyone, that it's important to have the "technical capabilities" (# 98), and that if a student wanted to take an online course it would be important that "they checked what they were getting into first and it was a topic of interest" (#70).

Final comments

The final comments reflected most of the themes elaborated on above. The issues of workload, due dates, pace, intensity, class requirements, and technology were part of many of the final comments.

> *It is really hard to estimate the number of hours you spend working for an online class, but from my own experience and talking to other classmates, the work seemed to be too much for a 3-credit class, even the teacher was late for some of his responses, that meant the work was too much for him too.* (#1)

> *Class due dates should be less stringent or at least give a weekend between assignments, even if it doubles assignments. Homework on top of full time work during the week is too difficult. Well organized and prepared. Complete and detailed. I learned a lot and enjoyed the class.* (#18)

Others reflected on the learning experience and the levels and advantages of the interaction they had with their instructor and their fellow students. The two following quotes give an excellent picture of what students regard as good online teaching practices.

> *I thought the course was excellent. I learned a tremendous amount because of the format. It really encouraged you to develop your writing skills as well as analytical thinking skills. I did not feel in any way that I was "cheated" out of the classroom environment. As a matter of fact, I got to know these people better—I have no clue as to what they look like, but I know how they think and have been able to exchange ideas which is much more valuable.* (#81)

> *It sure makes a difference when there are a lot of assignments to try so that one can understand the material they are trying to learn. It also makes a difference when you have an instructor like (X) who is very prompt and responsive to assignments and tests. I have really enjoyed this course and learned a lot.* (#82)

While students expressed clear concerns about various aspects of their online learning experience, their comments generally echoed the positive responses to the Likert scaled questions. The comments also make clear the importance students find in student to student interactions when they are made an integral part of the course and facilitated well.

Analysis

The students taking online courses through the CTDLC are adult, employed, part-time students. Online courses offer them the same convenience that their VCR does—the ability to time shift. The virtue of these courses for these students is not that it allows them to overcome problems of distance—most students are taking courses online at the institutions where they take courses in the classroom—but that it allows them considerable flexibility. They value the asynchronous form of the class and have problems with requirements such as collaborative or group projects which, at least as they perceive it, conflict with their ability to control their time.

Student's biggest concerns revolve around the amount of time spent on classes and the workload demands. It is unclear whether online classes really do demand more time, whether online teachers are more demanding and therefore their classes (both online and face to face) require more time, or whether students' expectations of how much time an online class should take are unrealistic. It is important that faculty make clear to their students as early as possible the time and workload issues so that students can make an informed choice as to whether this is the correct mode of learning for them.

Increasingly, however, students are becoming repeat online learners. They are becoming sophisticated at understanding the factors that contribute to an excellent learning experience. They are looking for meaningful interaction among students and between themselves and the instructor. They expect well designed courses, clear assignments, and a good use of the resources (such as the web) which are available to them. A sense of humor, excitement about the class, challenging materials, and genuine enthusiasm about the subject matter all help in creating a positive learning experience for students.

Clear assignments and expectations, meaningful interaction among students, faculty responsiveness, a course design which encourages analytical thinking and provides different ways to approach the material are not specific to online teaching. They are the fundamentals of good instruction in any type of setting. It is clear that courses and instructors who can bring these elements into their online classes encourage student learning and enthusiasm despite many of the challenges that online classes pose for learners.

Limitations and Implications for Further Research

The strongest limitation of the survey is that the respondents represent a voluntary sample primarily of students who finished the course. There is no way of knowing whether the approximately 40% of students who completed the survey are similar to other students who finished the course, but did not complete the survey. Students who withdrew or dropped out and who might have provided a less positive view of these classes were not represented at all.

While this research helps us look at successful students' perceptions of online classes, it lacks the input of students who were not successful or whose experiences on line lead them to withdraw or drop out. It is essential to include those voices in the research and to begin to explore several other questions. Are there students who don't benefit from online learning and what characterizes them? Are there changes that can be made in course design that would benefit these students? Are there other changes such as pre-enrollment advising which would enable students to better chose the type of course that would most benefit them.

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WHO TALKS TO WHOM ON CAMPUS: USING A SURVEY OF STAFF SATISFACTION WITH THE SERVICE OF UNIVERSITY OFFICES TO DESCRIBE THE STRUCTURE OF ADMINISTRATIVE LIFE

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Introduction

This study describes a University Services Survey conducted by a New England public residential university. The university is using this survey to establish a continuous quality improvement data system for their university services. The information provided by the survey also permits the construction of a model of the frequency with which various offices on the campus communicate with one another. These patterns are sometimes surprising, and yield insights into administrative life. More importantly, the patterns suggest ways of reducing the complexity of the information being reported to administrators, using empirical data as opposed to sometimes artificial, a priori administrative divisions.

The survey was conducted to assess employee satisfaction with the administrative offices of the university. Respondents indicated how often they contacted each unit and how well each unit performed on five customer-service dimensions. Customized reports of the results were created for each unit and presented to the unit heads in divisional meetings. The unit heads used this information to prepare quality improvement plans, which are part of their annual reports.

However, the survey also functions to answer questions about the organizational structure of the institution. The New England Association of Schools and College (NEASC) accreditation standards require that institutions demonstrate that their administrative structures are appropriate for their purposes:

> *...Through its organizational design and governance structure, the institution creates and sustains an environment that encourages teaching, learning, scholarship, and where appropriate research, and it assures provision of support adequate for the appropriate functioning of each organizational component.*
>
> NEASC Standard 3.1

One of the questions in the survey is "How often do you contact this area?" Aggregating responses to this question provides a picture of quasi-network communication structure of the offices on the campus. Since the respondents remain anonymous, it is impossible to build a full network dataset. But offices can be characterized in terms of how often they are contacted by different types of university employees. Also offices can be differentiated into "structural equivalent" groups, if they are often contacted by the same people on campus. Differentiating offices by who they were contacted by, a measure of "range," how often they were contacted, as a quasi-centrality measure, and by structural equivalence groupings, allows institutional researchers to explore patterns of work dependency, and possible directions for organizational reform.

Literature Review

Empirical research into communication network structures in organizations has led in many directions, from the diffusion of innovation to identifying ruling elites. Some network researchers have used communication network data to asking questions about organizational redesign. Most immediately, communications network information can inform the construction of telecommunications and computer systems, mapping these systems onto real existing flows of communication.

Making a telecommunications system consistent with the existing communications structure is far less pressing than creating congruence between actual patterns of communication and the administrative hierarchy. It is much more difficult to route decision-making through a redundant administrator than to route communications through a redundant server.

Despite the appealing empirical character of communication network analysis, and its tangible link to the workflow or work process studies that many universities already conduct, we have discovered no universities who have used empirical communications network analysis in organizational evaluation and redesign. Certainly this is due in part to the difficulty in collecting a full network dataset. Also researchers may find worry that decision-makers may find the concepts and analyses foreign and unhelpful.

But we believe that network theories and concepts can be made intuitive, and have many demonstrated applications in organizational analysis. Network analysis has derived many possible measures that could be applied to organization evaluation.

For instance, an organization may want to identify

- **Groups** Groups are highly interconnected sets of actors known as cliques and clusters. In network analytic language, they are densely knit and tightly bounded, i.e., most relevant ties stay within the defined network. The presence of groups in the same office, or the same building, to facilitate communication, is to be expected. If communication groups exist in offices across campus, it may raise questions about the efficiency of their work organization. It may be that their functions need to be consolidated, and brought under a common authority. If the groups are not knit together by functional, work-related, communication that may indicate a social dynamic of another kind.

- **Centrality** Centrality is determined by an analysis of the average number of links that it takes to link an individual to any other, which is partly a functional of the number of ties an individual or office has with other individuals or offices. Those offices with the smallest path distances in a network are globally central to the network, and are in the best position to help coordinate work. Centrality is closely tied to dependency and power. The more offices that an office communicates with, the more likely that they hold power as arbiters of information and resource flows. Determining that there are offices that are central to work flow that are under-staffed, or peripheral in the formal authority hierarchy, can be very illuminating. On the other hand, offices on the periphery of the communication network can be expected to be less successful in carrying out their tasks, while dysfunctional offices may be more likely to end up in the periphery.

- **Range and Multiplexity** Range measures the number of different types of people or offices an individual or office has a relationship with. Since offices tend to be linked to similar offices, greater ranges may improve coordination. For instance, on a campus, offices that tie together faculty, staff and administrator, and thereby discourage balkanization, are key. Campuses with restricted range may want to establish committees are working groups that establish new linkages. Multiplexity is a measure of the number of different types of contact or elements exchanged between two network members.

- **Structural equivalence** (SE) measures the similarity in role or network connections among a set of organizations. SE can identify all the regular clients of a particular offices' services, and a group of offices which regularly serves a clearly identifiable subpopulation. Structurally equivalent offices may be tightly intercommunicating, or not intercommunicating.

In this study, given that we only have quasi-network data, we will be focusing on the concepts of centrality, structural equivalence and structural holes.

Structural Equivalence (SE) and Cohesion

SE is difficult to separate from the cohesion of tightly bound "cliques" or "clusters". A group which has a dense web of communications within itself, such as an office, will naturally also be structurally equivalent, since they share the same set of contactees, i.e. one another. On the other hand, if they never communicated with one another, and only spoke to their immediate superior they would again be structurally equivalent, but not be a clique or cluster. In that dysfunctional situation the office could benefit from more frequent communication amongst the office workers.

Figure One below illustrates a group of offices, cliques A, B and C, defined by communication density. Figure Two has two groups, A and B, who are identified by structural equivalence in their common relationships one another, and to (a) and (b). In Figure Three the same groups A and B are only identified in terms of their structural equivalence vis-à-vis (a) and (b), since they do not communicate amongst themselves. In the situation in Figure Three (a) and (b) are in a much more powerful position, as information arbiters, than they are in Figure Two.

Figure One: Groups of Offices (Cliques) Defined by Communication Density[1]

Figure Two: Groups Defined by SE, with Cohesion

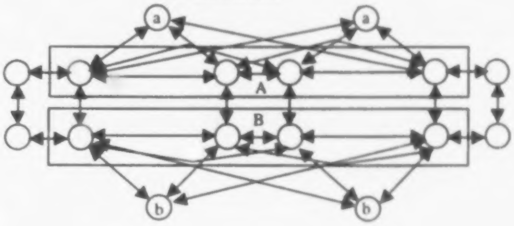
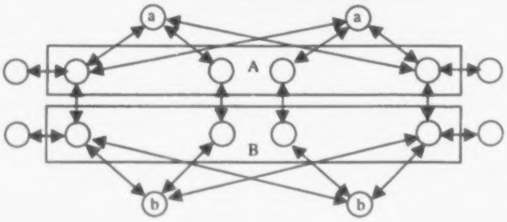


Figure Three: Groups Defined by SE, without Cohesion



In this study we will examine both number of contacts per office, as a proxy for centrality, and groups identified by structural equivalence. In order to determine whether the structurally equivalent groups are loosely or tightly bound, we have conducted a series of interviews.

Methodology and Data Sources

The University Services Survey asked six questions about each of the institutions 68 administrative offices. It is important to note that academic departments were *not* included in this survey. Other instruments, such as the Survey of Graduates, are used in assessment of the academic departments. The survey questions and responses are given below.

The first question asks respondents to identify their employee type as one of the following four responses: teaching faculty, staff, administrator, and management/confidential. These four groupings represent the major division of employees by their bargaining unit or official designation. The following six questions are asked for each of the 68 units. A space is also included for open-ended comments.

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[1] Figure 1 referenced in this article may be obtained by contacting the authors.

How often do you contact this area?	Responses: 1-Often 2-Occasionally 3-Not at all
Does this office… 1. Respond promptly to requests 2. Provide accurate information 3. Exhibit helpfulness and courtesy 4. Is flexible and creative in problem-solving 5. Perform functions for you effectively	Responses: 1-Always 2-Sometimes 3-Rarely/Never

In March and April of 1999 the Office of Institutional Research at the university mailed out two mailings of the University Services Survey to 693 full and part-time employees. By April 20th they had received back 262 responses for a 38 percent response rate.

Table One: Respondents to the USS

	Respondents			Total Sample	
	Number	Total %	Valid %		
Teaching Faculty	92	35%	41%	342	51%
Staff	91	35%	41%	163	24%
Administrators	33	13%	15%	138	21%
Management-Confidential	8	3%	4%	24	4%
Total	224	86%	100%	667	100%
No Staff Category Marked	38	15%			
	262	100%			

The distribution of survey respondents overrepresents "staff", and underrepresents faculty and administrators. Since 15% of respondents chose not to reveal their staff type, despite assurances of confidentiality, the exact representativeness of the respondents is difficult to determine.

Results

SE Factor Groupings

Exploratory factor analysis was used to identify underlying factors explaining the correlation of the contact scores for the functional units. Factor analysis was chosen for this project because its results are easy to explain and present, and its suggested grouping made more intuitive sense than those produced by the other methods examined. Units that loaded similarly on a particular factor tend to be contacted (or not contacted) by a similar group of survey respondents, i.e. they were structurally equivalent (SE). For example, employees, generally faculty, who frequently contact one unit in the library tend to contact other library units frequently. Therefore the various offices of the library tend to correlate with the same underlying SE factor.

A number of solutions were examined, including 15, 8, 7, 6, and 2 factors. Six factors provide the smallest number of meaningful, easy-to-interpret groupings. Seven groups of units derive from the six factors:

Internal Administrative Functions. This group includes most of the finance units and the central administrative functions, like the Mailroom and the Data Center.

External Administrative Functions. This group includes those units which communicate extensively outside the institution, such as Institutional Advancement, University Relations, and Personnel - Recruiting.

Bridge between Internal-External Functions. This group, which includes units that loaded on both of the above factors, includes units that coordinate contacts between entities internal and external to the institution. The President's Office is the prime example of this group.

Academic Services. This group provides academic services and manages the academic aspects of the institution. It includes the academic deans and vice president, Continuing Education, and the Registrar.

Student Services. This group provides nonacademic services to students. It includes nearly all the units from the student affairs division of the institution, including Housing and Residential Life, Health Services, and the Vice President for Student Affairs.

Support Services. This group secures and maintains the physical infrastructure of the institution. It includes all the units in the Physical Plant (Maintenance, Grounds, Janitorial/Custodial, and Capital Projects) and the police units.

Faculty Support Services. This group provides academic services to faculty. It includes the Bookstore and all the units in the library.

Qualitative Investigation of SE Anomalies

Several offices do not appear to be similar to the other offices in their groups. The seven anomalous groupings are as follows:

1. The Academic Advisement Center, a unit that provides advising and tutoring, that oversees students on academic probation, and that operates a special admissions program, is grouped with Internal Administrative Functions rather than Student Services or Academic Services, as would be expected.
2. Affirmative Action is grouped with Student Services rather than with Internal Administrative Functions.

3. Athletics Department- Intramurals & Recreational Programs groups with both Support Services and Student Services.
4. Athletics Department- Intercollegiate Sports groups with both Support Services and Student Services.
5. Personnel - Employee Benefits groups with Support Services rather than with Internal Administrative Functions.
6. Personnel - Labor Relations groups with Support Services rather than with Internal Administrative Functions.
7. Police - Parking Services groups with both Support Services and Faculty Support Services.

The qualitative portion of this project seeks to uncover the causes of these anomalous groupings through interviews with the employees in those units. The following five questions were asked to employees in each of the anomalously grouped units:

1. Which offices do you serve?
2. Which units serve your office?
3. Why do you think your unit was grouped with this (these) group(s)?
4. How does the structure of the institution affect how you work with other offices?
5. How smooth are the processes that involve more than one unit?
6. What improvements would you make to the organizational structure of the institution?

The responses to these questions were noted and the findings will be discussed briefly below.

"SE with Cohesion" Groups

Affirmative Action and Student Services. The Office of Affirmative Action grouped with Student Services rather than with other administrative units, as would be expected. The office primarily works with personnel and the President's Office on personnel issues. Its unexpected grouping with Student Services may have occurred because the unit provides some services to students with disabilities. The unit also processes sexual harassment complaints for students.

Athletics and Support Services. Units in the Athletics Department grouped with Student Services as expected, but they also grouped with Support Services. While these units mainly serve students, they also manage the external rental and internal reservation of sports facilities for the institution. The athletics department also coordinates vehicle reservations. These administrative functions may be the reason for the grouping of the athletics units with Support Service units, like maintenance, grounds, and the police.

Parking Services and Faculty Support Services. Police - Parking Services groups with both Support Services as expected, but also with Faculty Support Services. This appears to be the result of frequent complaints by faculty about the shortage of faculty parking at the institution.

"SE Without Cohesion" Groups

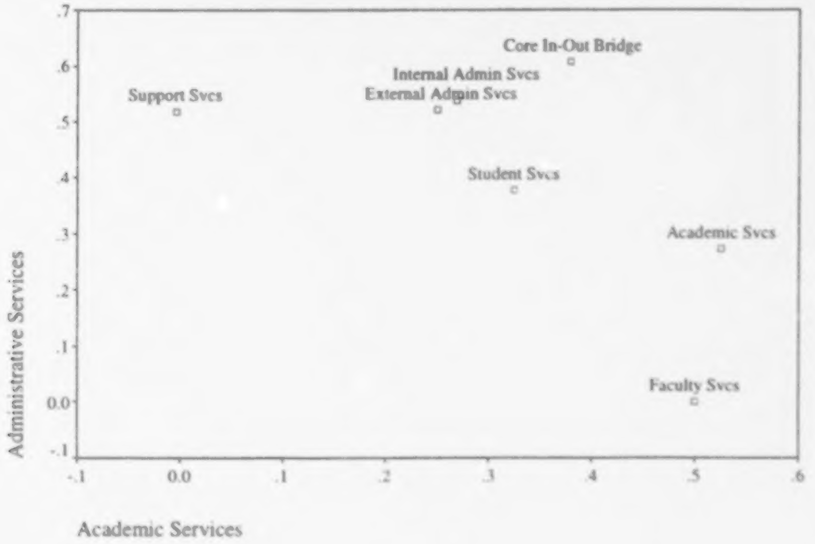
The **Academic Advisement Center**, a unit that provides advising and tutoring, that oversees students on academic probation, and that operates a special admissions program, is grouped with Internal Administrative Functions rather than Student Services or Academic Services, as would be expected. Employees in the unit explained that the Center is a conduit for many administrative and academic functions. It refers students to many other offices, and thus has wide contacts. That may be what has caused it to group it with the central administrative functions, like payroll, purchasing, and the mailroom. Further investigation may be needed to uncover the cause of this grouping anomaly.

Personnel - Employee Benefits and Personnel – Labor Relations group with Support Services, rather than with Internal Administrative Functions as would be expected. Discussions with people in physical plant made clear that only the union stewards are in contact with both the personnel department and support services workers. In this case, it was clear that although Personnel and Support Services were structurally equivalent, they were not internally cohesive.

Administrative and Academic Dimensions of Organization

Figure Five presents a scattergram of structurally equivalent groups of offices by their factor loadings for the two-factor model. The factors distinguish administrative and academic functional units. For example, Support Services loads as high in communication with administration, and almost no communication with academic services, while Faculty Services loads as having almost no communication with the administration side.

Figure Five: SE Groups Arrayed on the Two Principal Factors Underlying the Inter-Office Contact Structure



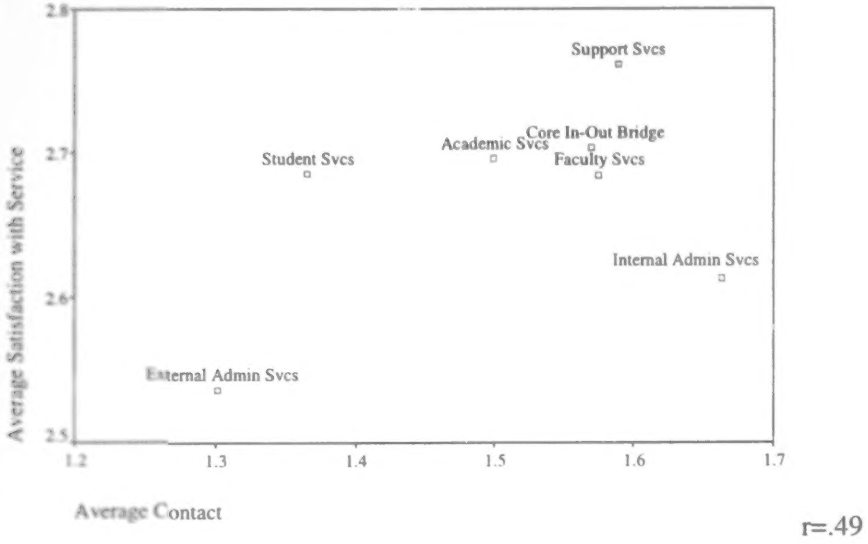
r = -.62

Centrality and Satisfaction

Feeley and Barnett (1997) examined a structural equivalence model, a social influence model, and an erosion model as predictors of employee turnover. The SE model predicted individuals in similar positions vis-à-vis intermediaries, such as bosses, would turn over at similar rates. The social influence or contagion model predicted that employees with a greater percentage of direct communication links with leavers would be more likely to leave their job. The erosion model posited that individuals located on the periphery of a social network would be more likely to leave their job or "fall off' the edges of the social network. They found support for all three models, with erosion explaining the most.

As a corollary of turnover, we explored whether peripheral offices were less likely to be satisfying to their users. When the offices were grouped according to the SE model, as in Figure Six below, there was a clear and strong correlation between the satisfaction with the group, and the average amount they were contacted. The most peripheral group, which unfortunately included Planning and Institutional Research, Institutional Advancement, and University Relations, also had the lowest satisfaction scores. The group central to the Academic Services sub-network, Faculty Services, and the two Administrative groups with the highest contacts, Support and Internal Administration, also had high satisfaction.

Figure Seven: Amount of Contact with Group by Satisfaction with Service of Group



Discussion

SE Groupings

Our findings support the use of SE groupings as a method for analyzing the structure of higher education organizations. The one-way quasi-network nature of our data limited our ability to test all the structural features of the network. For example, we could not quantitatively demonstrate whether our SE groups were internally cohesive or were examples of groups defined solely by their association with other offices.

Our use of qualitative interviews was successful, however, in differentiating cases where SE groupings were not intuitively obvious, were in fact legitimate, either because of cohesion or structural equivalence.

Centrality and Satisfaction

University staff and administrators proposed many interesting suggestions for why some kinds of offices would provide more satisfaction. For instance, some offices only disburse benefits, while others are gatekeepers. In our study the most satisfactory offices were those that managed employee benefits and travel reimbursements. The least satisfactory were those, such as the Fiscal Affairs Director, who often was in the position to deny resources.

Our analysis of organizational structure, however, illustrates another dynamic. The offices of the university that were more central to the communication network were also deemed more satisfactory. Although the causation may also be that unsatisfactory offices become less central, campus decision-makers should take these structural disabilities into account in judging the performance of peripheral offices.

Validating Organizational Structure

One possible outcome of a network analysis of communication structures might be that individuals or offices scattered across a campus might be found to be a relatively cohesive group. If so, restructuring the organization to bring those workers together might improve the effectiveness of the organization. Although this is possible, we did not find this situation in our study. Our qualitative exploration of the apparent anomalies did not suggest that any of the anomalies were the result of poor organizational design, or that workers believed that significant improvements could be made to the structure.

Conclusions and Implications

We believe our study validates the use of one-way network data for the analysis of organizational structure in higher education. Sociometric and quasi-sociometric analyses of administrative interactions can yield rich insights into the ways that administrative life and communication cut across boundaries in organizational charts. The actual groupings of university offices embody and reinforce attitudes and norms of service, which are of central concern to continuous quality improvement. Communication structures can suggest organizational redesign for maximum efficiency.

Of course, it will be even more illuminating if institutional researchers can win the trust of employees and elicit full two-way network data. That is, employees would be asked to identify themselves and their units, as well as the offices with which they contact.

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THE EFFECT OF EXPECTATIONS VS. EXPERIENCE ON RETENTION AT MONROE COMMUNITY COLLEGE

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INTRODUCTION

It is believed that unrealistic expectations can lead to academic or social failure for students and ultimately to their withdrawal from college. Unrealistic expectations of MCC's incoming Freshman and Transfer students were in fact related to retention. On 16 of 34 survey items, student experience differed significantly from their pre-enrollment expectations by 10 to 41 percentage points. The following semester, returning and non-returning students differed significantly on several of these items. It is hoped that by better understanding the expectations (and subsequent experience) of entering students, MCC can help them deal more effectively with unrealistic expectations through the orientation process, counseling and their instructors. The goal is student success and increased retention rates.

PROCEDURE/SAMPLE

At the suggestion of MCC's Institutional Research Department, a committee comprised of a representative from Admissions, Counseling, Marketing, Orientation and Research was created to develop a survey of student expectations. The Expectation Survey was sent to all incoming Freshman and Transfer students (N=5116) who were accepted for the Fall 1998 semester between mid-September 1997 and mid-September 1998. At 31%, the response rate was quite high for survey research (N=1559). In order to determine which expectations were unrealistic, at the end of the fall semester a follow-up Experience Survey was sent to all 1559 students who responded to the Expectation Survey. The response rate was 32% (N=494). Compared to the population, responders were slightly older, had higher GPAs, were more likely to attend MCC and to return the next semester. In addition, a larger percentage of females and Caucasians responded.

RESULTS/DISCUSSION

Expectations: Total Sample

Looking at all 1559 students accepted at MCC who responded to the survey:

- Overall, students expect MCC will provide them with a good education (about 90%). However, 60% of full-time students plan to study far less than the recommended 2 hours outside of class for every 1 hour in class). Students with lower high school averages plan to study about the same number of hours as the better students.

Unfortunately, in order for them to succeed, they may need to spend more time studying than the better students.

- Probably because 70% have to work while attending MCC, a large percent expect to feel stressed about balancing studies and job (33%) and about doing well academically (50%). Almost 40% do not think they know what they need to do in college to be successful without a lot of extra help.
- Perhaps as a result, they are expecting considerable support. This includes frequent opportunities to talk to instructors outside of class and regularly being kept informed of academic progress (82% each), academic advising before registering (73%) and instructors to review reading assignments in class (67%).
- Many are also expecting "services" like help with career exploration/planning (64%) and assistance finding a job after graduation (62% of those planning to earn degree).
- Many expected services not routinely provided by MCC at the time of the survey: faculty advisor assigned (79%), told amount of financial aid before registering (71%), help with filling out financial aid application if help needed (91%). Regarding financial aid, currently help is given to answer a specific question, but there is no one to sit with a student to help them fill out their application.
- In addition, 78% of students planning to earn an MCC degree expect to finish their program in 2 years when in fact only 10% actually do.

Caveat

Because the samples were large (N=1559 for Expectations and N=494 for Experience), relatively small differences tend to be statistically significant, but not necessarily very important. Because the administrators' dilemma is to balance the cost of meeting expectations with the benefits, with very few exceptions only groups with statistically significant differences of at least 10 percentage points were emphasized in the text below.

Expectations vs. Experience: Matched Sample

Responses to the Expectations and Experience surveys for the matched sample of 494 students[1] were compared. On 16 of 34 survey items, what students experienced at MCC differed from their pre-enrollment expectation by 10 to 41 percentage points. The following are the highlights of some of the most significant results.

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[1] The total sample (N=1559) and the matched sample (N=494) answered the Expectation Survey very similarly: 28 of 34 items differed by 2 percentage points or less; the largest difference was 5 percentage points for one item; only 3 items had statistically significant differences (2, 4 and 5 percentage points).

Students had realistic expectations about class attendance, relationship with instructor and need for academic advising. However, there were some items for which their experience did not match their expectation:

- 83% expected their instructors to keep them regularly informed of their progress, only 51% said their instructors did
- 80% expected to have an advisor in their program assigned, only 56% did
- About 60% of full-time students expected to study far less than the recommended 2 hours for every credit. At the end of the semester, they said they actually studied even less.
    - 57% of full-time students reported studying less than one hour per credit and still earned a 2.7 GPA. Those studying at least one hour per credit earned a 3.2. Thus, more study time did improve grades. (Note: The average MCC Fall 1998 GPA for full-time Experience respondents was 2.88.)

Students were fairly realistic about changes that would occur in their current relationships with friends and family. However, there were some areas where their expectations regarding other social situations differed greatly from their experience:

- 60% expected to participate in out of class activities and events, only 19% did
- While no racial prejudice should be tolerated, students experienced far less than they expected (see Expectations of Different Respondent Groups: Total Sample for additional insight about expectations of racial prejudice as related to age and ethnicity.)
    - 52% expected some students would be treated unkindly by other students because of racial prejudice, only 11% said students were
    - 16% expected students to be treated unfairly by faculty or staff because of racial prejudice, but far fewer said students actually were (4%)
- 90% expected to make friends with students from many different cultural backgrounds, but only 59% did

A large percentage (71%) of students expected to be told how much financial aid they would get before registering for classes. However, only 45% of those who applied for financial aid reported actually being told their financial aid amount before registering.

Retention: Matched Sample

There were five retention-related items for which returning and non-returning students had very similar expectations at the beginning of the Fall semester, but very different experiences by the end of the semester. Their experiences differed as follows:

- Frequent opportunities to talk to college instructors outside of class (83% returning students vs. 65% Non-returning students).
- Making new friends at MCC (87% Return vs. 67% Non-return)
- Someone at MCC would have helped fill out financial aid application (of those who applied for financial aid, 86% Return vs. 67% Non-return).
- Assigned faculty advisor in MCC program (59% Return vs. 33% Non- return)
- Planning to earn an MCC degree or certificate (85% Return vs. 56% Non-return)

On two questions, Returning and Non-returning students responded quite differently on the Expectation survey, but even more differently on the Experience Survey:

- Expecting to finish program in 2 years (62% Return vs. 32% Non-return)
- Participating in out-of-class activities and events at MCC (19% Return vs. 7% Non-return)

Returning students were more likely to take 4 or more courses in Fall 1998 (71% Return vs. 58% Non-return).

On the total Expectations Survey (N=1559), a larger percentage of students who did not return in Spring 1999, than who did return, had to work to attend classes (67% Return vs. 77% Non-Return).

Expectations of Different Respondent Groups: Total Sample

Returning to the total sample of 1559 students, additional insights emerge regarding student expectations when responses are analyzed by different groups.

Program Type: Students in the developmental program are less confident than those in transfer and career programs about what they need to do to be successful in college (48% vs. 64%). However, they do not expect to feel any more stressed about doing well academically than the other students. Nor do they plan to study any more than the other students. They are most likely to plan their schedule to be on campus for only half a day. They are expecting more support than the other students, e.g., instructors reviewing reading assignments in class (84% vs. 66%).

High School Grades: Students with lowest high school average (D/F) seem to be ready to get on with their life (two thirds are over 20 years old), but expect it will be a slow process and that they will need help, especially since less than half of them think they know what to do in college to be successful without a lot of extra help. They are least likely to expect their instructors to get to know them personally (47% vs. 60%).

Age: The under 20 group are most interested in transferring (75% vs. 40% of older students). Older students compared to under 20 students are more likely to expect their instructors to review most reading assignments in class (75% vs. 60%) and are more concerned about balancing their studies with their job (40% vs. 30%).

Expectation of racial prejudice against students by students is more related to age than to ethnicity. In fact, those under 24 are twice as likely as those 25 and over to expect to "see incidents of racial prejudice by students at MCC" (44% vs. 22%). Those under 20 are much more likely than those 25 and older to expect "some students will be treated unkindly by other students because of racial prejudice" (62% vs. 36%), with Hispanics least likely to expect it (39% vs. 53%-61% for other groups). It is not clear whether there is a mellowing or difference in perspective that comes with age and being "out in the world," or whether younger people are in fact experiencing/seeing more incidents of racial prejudice in their life or in the media than are older people.

Students who plan to earn MCC degree or certificate: Students not planning to earn an MCC degree or certificate are more likely to feel they know what they need to do in college than those planning to earn an MCC degree (76% vs. 61%). In addition, students not planning to earn an MCC degree expect MCC courses to be easier than courses at local 4 year colleges (46% vs. 31%). Their confidence may be why they are more likely to plan to transfer to a 4 year school (92% vs. 62%) than to start or continue a career after leaving MCC.

Ethnicity: Although expectation of racial prejudice against students by students is more related to age than to ethnicity, twice as many African Americans and Asians (34% each) as Hispanic and Whites (17% each) expect "some students will be treated unfairly by faculty or staff because of racial prejudice." This expectation may result from actual life experience, feelings that they may know the material but can not effectively communicate that knowledge to their teachers, or cultural differences.

Asian students (N=48) have the highest high school average (70% have A or B average). A larger percent expect to feel stressed about doing well academically (67% vs. 28-52% for other groups). They are less sure about knowing what they need to do in college to be successful without a lot of extra help (44% vs. 53% for African Americans and 66% for Whites). They are more critical of MCC in comparison to other schools: They are less likely to believe their MCC education would be at least of equal quality to local private colleges (68% vs. 87% for others) and more likely to believe their courses will be easier than at local 4-year colleges (54% vs. 30%-45% for others

African American students (N=159) have lower high school averages (40% have A or B average) and full time students expect to study less than the other three groups (18% of full-time students plan to study 1-4 hours, compared to 6% of the other groups). They are less stressed about academic success (28% vs. 52-67% for other groups) and social success (13% vs. 19-28% for other groups).

Hispanic students (N=78), like Asians, are less sure about what they need to do in college to be successful without a lot of extra help (40% vs. 53% for African Americans and 66% for Whites). They are less likely to expect to transfer (42% vs. 60-72% for others) and more likely to continue their career (21% vs. 6-10% for others). They are more likely to be working 30 or more hours a week and are more concerned about balancing their studies and job.

White students (N=1187) are more confident about what will be expected of them in college (66% vs. 40-53% for others) and feel less in need of extra help.

Time of Acceptance: Compared to those accepted earlier, those under 20 who were accepted in the summer (July 7, Sept. 19, 1998) are more critical of MCC's education by 10 percentage points. They are less likely to plan to earn an MCC degree or certificate or to expect a faculty advisor to be assigned to them.

Female students accepted in the summer (July 7- Sept. 19, 1998) are most concerned about balancing studies and job and a larger percent expect to feel stressed.

Overall Demographics for Expectation and Experience Surveys

	Population: All First-time and Transfer Students		Samples:			
			Expectations Survey		Experience Survey	
	Count	Col %	Count	Col %	Count	Col %
Age						
Mean		22.2		23.5		25.4
Under 20	2969	58%	873	56%	253	51%
20-24	1004	20%	248	16%	64	13%
25 and over	1141	22%	437	28%	177	36%
Total	5114	100%	1558	100%	494	100%
Ethnicity						
African American	717	14%	164	11%	40	8%
Hispanic	260	5%	82	5%	19	4%
White	3615	71%	1171	75%	392	79%
Asian	153	3%	46	3%	19	4%
American Indian	39	1%	9	1%	2	0%
Non-resident Alien	70	1%	21	1%	6	1%
Unknown	262	5%	66	4%	16	3%
Total	5116	100%	1559	100%	494	100%
Gender						
Male	2456	48%	659	42%	192	39%
Female	2660	52%	900	58%	302	61%
Total	5116	100%	1559	100%	494	100%

High School average						
Mean	NA	NA	1337	2.67	466	2.79
90-100 or A	NA	NA	188	13%	86	18%
80-89 or B	NA	NA	700	47%	218	47%
70-79 or C	NA	NA	525	35%	145	31%
60-69 or D	NA	NA	56	4%	12	3%
Below 60 or F	NA	NA	15	1%	5	1%
Total	NA	NA	1484	100%	466	100%
MCC Fall 1998 GPA**	3722	2.33	1337	2.57	487	2.95
Program type						
Career	1485	30%	503	32%	173	35%
Transfer	2892	59%	910	58%	271	55%
Developmental	492	10%	146	9%	50	10%
Total	4869	100%	1559	100%	494	100%
Campus attended						
Brighton only	3276	87%	1182	88%	436	90%
DCC only	343	9%	106	8%	37	8%
Both	143	4%	53	4%	14	3%
Total	3762	100%	1341	100%	487	100%
Enrollment status Fall 1998						
Enrolled Fall 1998	3762	74%	1341	86%	487	99%
Not enrolled Fall 1998	1354	26%	218	14%	7*	1%
Total	5116	100%	1559	100%	494	100%
Return/Non-return Status						
Attended Fall 1998, Returned Spring 1999	2910	77%	1095	82%	442	91%
Attended Fall 1998, Not returned Spring 1999	852	23%	246	18%	45	9%
Total	3762	100%	1341	100%	487	100%
Early vs. Late Acceptance						
Sept 15, 1997- July 6, 1998	3023	60%	1056	68%	332	67%
July7- Sept 19, 1998	2052	40%	503	32%	162	33%
Total	5075	100%	1559	100%	494	100%

Note: High school average is self-reported. Other data obtained from MCC database.

Totals may not equal 100% due to rounding.
NA = Not available or Not applicable

* Enrolled but withdrew　　　** W=F, PE excluded

APPENDIX: Part 2 Questions and Results by Functional Area for Matched Sample

INSTRUCTIONS: We are interested in knowing what you believe you (will experience/ACTUALLY EXPERIENCED) at MCC. Please respond to every statement by circling YES if the statement describes what you (expect/experienced) at MCC or NO if this is not what you (expect/experienced) at MCC.

NOTE: Parentheses shows wording for both Expectations (Pre) and Experience (Post) surveys. Data reflects responses to Pre and Post surveys for matched sample (N=494).

	Pre vs.	Post		Statis
	% Yes	% Yes	Change	SIG
EDUCATIONAL QUALITY				
MCC (will be/is) more difficult than high school. (Q4)	90	76	-14	*.000
MCC courses (will be/are) easier than courses at local 4-year colleges. (Q3)	33	38	5	*.052
My MCC education (will be/is) at least of equal quality to local private colleges. (Q2)	86	79	-7	*.001
After completing an MCC degree, it (will be/is) easy to transfer to a 4-year college. (Q1)	92	86	-6	*.003
INSTRUCTOR/CLASSROOM				
There (will be/are) frequent opportunities to talk to my college instructors outside of class. (Q5)	83	82	-1	.511
My college instructors (will get/got) to know me on a personal level. (Q6)	63	56	-7	*.027
My MCC instructors (will regularly/regularly) keep me informed of my academic progress. (Q12)	83	51	-32	*.000
My MCC instructors (will review/review) most reading assignments in class. (Q13)	69	76	7	*.009
My MCC instructors (will require/require) attending classes regularly. (Q14)	96	97	1	.706
My grades at MCC will be affected if I (miss/missed) several classes. (Q15)	96	93	-3	.070
ADVISING/PLACEMENT				
Students who (do/did) poorly on their placement test (must/had to) take courses without credit to build up their skills before they (can/could) take most credit courses. (Q17)	62	74	12	*.000

I (must start/started) at the course level determined by my placement test scores in math, reading and writing. (Q18)	80	69	-11	*.000
A faculty advisor in my MCC program will be assigned to me (I have a faculty advisor from my MCC program). (Q7)	80	56	-24	*.000
I (will need/needed) academic advising before I register/registered for courses at MCC. (Q8)	73	71	-2	.294
(I received academic advising before I registered for courses at MCC).	NA	77	NA	
FINANCIAL AID				
Students (will be told/are told) how much financial aid they will get before registering for classes. (Q19)	71	41	-30	*.000
(Did you apply for financial aid?)	NA	61	NA	
(I needed help filling out my financial aid application.)	NA	41	NA	
If I (need/had needed) help, someone at MCC (will help/would have helped) me fill out my financial aid application. (Q20)	91	78	-13	*.000
CAREER PLANNING/EXPLORATION				
I (will need/needed) help with career exploration and planning. (Q32)	63	51	-12	*.000
MCC will assist me in finding a job after graduation. (Q33)	60	52	-8	*.002
Potential employers will want to see my MCC grades. (Q34)	86	76	-10	*.000
WORK AND SCHOOL				
It (will be/is) difficult for me to balance my studies with my job. (Q10)	30	33	3	.244
In order for me to take classes, I (will have/have) to work while attending MCC. (Q31)	67	63	-4	.078
SOCIAL RELATIONSHIPS				
I (will participate/participated) in out-of-class activities and events at MCC. (Q26)	60	19	-41	*.000
My relationship with my family (will change/changed) when I (go/went) to MCC. (Q24)	24	32	8	*.002
My relationship with my friends (will change/changed) when I (go/went) to MCC. (Q25)	34	40	6	*.033

I (will make/made) new friends at MCC. (Q22)	93	84	-9	*.000
I (will make/made) friends with students from many different cultural backgrounds at MCC. (Q27)	90	59	-31	* ** .000
EMOTIONAL				
I (will feel/feel) stressed about doing well socially at MCC. (Q21)	19	15	-4	*.038
I (will feel/feel) stressed about doing well academically at MCC. (Q16)	49	58	9	*.002
RACIAL PREJUDICE				
I (will see/saw) incidents of racial prejudice by students at MCC. (Q23)	33	14	-19	* ** .000
Some students (will be/were) treated unkindly by other students because of racial prejudice. (Q28)	52	11	-41	*.000
Some students (will be/were) treated unfairly by faculty or staff because of racial prejudice. (Q29)	16	4	-12	* ** .000
MISCELLANEOUS				
I know what I need to do in college and (will be/am) successful without a lot of extra help. (Q9)	61	77	16	*.000
I will finish my MCC program in 2 years. (Q11)	73	59	-14	*.000
(From September 1998, how long will it take you to finish your MCC program?)				
Less than 2 years	NA	16	NA	
More than 2 years	NA	34	NA	
Not planning to finish program at MCC.	NA	8	NA	
I (plan to schedule/scheduled) my MCC classes so that I can spend only half a day on campus. (Q30)	52	53	1	.792

* Statistically significant

** Statistically significant differences between total sample (N=1559) and matched sample (N=494) on Expectations Survey (2-5 points).

NA means not asked.

NOTE: Part 1 questions and responses are not provided due to lack of space. These questions asked about plans: to enroll, to earn an MCC degree, for employment/transfer immediately after leaving MCC, for number of courses to take, for number of work and study hours. Only planning to earn an MCC degree/certificate and number of study hours differed significantly between Expectations (Pre) and Experience (Post) surveys.

THE DEVELOPMENT OF A WEB-BASED SURVEY: SURVEY DESIGN TO DATA ANALYSIS

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Abstract

The development and utilization of web-based surveys in institutional research has been increasing. This workshare demonstrates the development of a web-based survey from start to finish and discusses the benefits as well as the obstacles that were overcome during the administration process.

Introduction

In order to recommend programs, policies, and practices to improve the environment and quality of life at the University of Delaware, the Environmental Concerns Committee at the University developed an *Environmental Attitude Survey.* The Office of Institutional Research and Planning, with the help of the Environmental Concerns Committee, developed and administered one version of an on-line survey to students and a similar version to faculty and staff. The goal of the survey was to establish a benchmark of current environmental practices (e.g., recycling and resource conservation) and to better understand the current attitudes toward environmental issues on campus.

The Environmental Concerns Committee and the Office of Institutional Research and Planning decided to administer the *Environmental Attitude Survey* via the web to further develop technology resources on campus, facilitate the data analysis process, conserve paper resources, and reduce survey administration time and costs. The two (2) versions of the survey may be accessed at http://www.irp.udel.edu/ecc/.

Methodology

This particular web-based survey design and administration did not utilize a software package. The survey design was completed by developing a Hypertext Markup Language (HTML) file in the text editor, Notepad. The survey design may also be completed by utilizing web development software. The HTML programs for this particular survey may be viewed at http://www.irp.udel.edu/ecc/student.html and http://www.irp.udel.edu/ecc/faculty-staff.html through the page source.

Perl (Practical Extraction Report Language) was the program language utilized to authenticate the survey permitting respondents to log in, monitor who completed the survey, and collect the respondent's data. It has been suggested that Perl is the language of choice for writing Common Gateway Interface (CGI) scripts (Kieley, 1996). Perl may be donwloaded at http://www.activestate.com/. Other programming languages that may be utilized to write CGI scripts include: C and C++, Pascal, Python, shell scripts (Unix), Fortran, and ASP (a Microsoft extension). The Perl programs for this particular survey administration included files that verified a respondent's university identification number, removed the associated identification number once a survey was submitted, sent the respondent's a notice of submission, and sent the survey responses to the appropriate database.

Once the survey was ready to be administered, each randomly selected respondent received an email message instructing him or her to visit the web site where the *Environmental Attitude Survey* was located. Respondents were randomly selected to ensure a representative sample. Approximately 3,500 undergraduate and graduate students received an email message requesting their participation. An incentive was established to encourage student participation. The email informed students that they would be entered into a drawing for a gift certificate to a local book and music store if they submitted a survey on-line. The student data set consisted of 620 surveys leading to a student response rate of approximately 18%. Approximately 1,450 faculty and staff members received an email message requesting their participation. The faculty and staff data set consisted of 542 surveys leading to a faculty and staff response rate of approximately 37%.

Survey respondents were required to enter their university identification number (a.k.a., social security number) in order to gain access to the on-line survey. This restricted access to people who were the randomly selected respondents and it ensured that respondents could not answer the questionnaire more than once.

The following Perl program file (lib.ph) was utilized to help secure the survey administration[1]:

```
#Library of common routines and NT hacks.

#IP address of current machine, used for authentication purposes:
$ip="enter IP address here";


#Subroutines:
sub lock { sleep(1) until(mkdir("$_[0].lock", 0711)); }
sub unlock { rmdir("$_[0].lock"); }
sub wait_lock { sleep(1) while( -d "$_[0].lock"); }

sub fget_list {
    local(*FL)=($_[0]);
    get_list(<FL>);
}

sub get_list {
    #old, cool way
```

```
        #local(%list)=($_[0] =~ m/(\b\w+)=([^&#]*)/g);
        local(%list);
        local($foo);

        $_[0]=~s/\n//;
        #new way, has to deal with multiple instances of same key
        $list{$1}=defined($list{$1}) ? "$list{$1}!$2" : $2
              while($_[0] =~ s/(\b[-\w]+)=([^&#]*)//);

        #Convert Hex format and other chars to normal characters.
        for $i (keys(%list)) {
              $tmp=\$list{$i};
              $$tmp =~ s/%26/&amp;/g;
              $$tmp =~ s/%3[Cc]/&lt;/g;
              $$tmp =~ s/%3[Ee]/&gt;/g;
              $$tmp =~ s/&lt;&lt;/</g;
              $$tmp =~ s/&gt;&gt;/>/g;
              $$tmp =~ s/&amp;&amp;/&/g;
              $$tmp =~ s/%09/&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;/g;
              $$tmp =~ s/%0[Dd]%0[Aa]/<BR_TMP>/g;
              $$tmp =~ s/\+\+/ &nbsp;/g;
              $$tmp =~ s/\+/ /g;
              $$tmp =~ s/%(\d[\dABCDEFabcdef])/chr(hex($1))/eg;
              $$tmp =~ s#%B7#<IMG SRC="/scup/img/bullet.gif" ALT="*">#g;
              $$tmp =~ s/%D4/<SUP>(tm)<\/SUP>/g;

              while($$tmp =~ s/\\html{([^}]*)&lt;([^}]*)}/\\html{$1<$2}/){} #&#125;
          while($$tmp =~ s/\\html{([^}]*)&gt;([^}]*)}/\\html{$1>$2}/){}
          while($$tmp =~ s/\\html{([^}]*)&amp;([^}]*)}/\\html{$1&$2}/){}
          while($$tmp =~ s/\\html{([^}]*)<BR_TMP>([^}]*)}/\\html{$1 $2}/){}
          while($$tmp =~ s/\\html{([^}]*)}/$1/){}
          $$tmp =~ s/<BR_TMP>/<BR>/g;
        }
        %list;
}

1;
```

The following Perl program was utilized to verify a respondent's university identification number[1]:

```
#!/usr/sbin/perl
eval 'exec perl -S $0 ${1+"$@"}'
      if 0;

my $data='/inet/www/ecc';

require 'lib.ph';

my %list=fget_list(STDIN);

my $ssn=$list{'ssn'};
```

my $data= is the location of the CGI-Bin directory. The Perl and database files are located here.

```
print "Content-type: text/html\n\n";

foreach $file ('student', 'faculty-staff') {
     &lock("$file.txt");
     open(SSN_FILE, "$file.txt");
     while(<SSN_FILE>) {
          chomp;

          last if($ssn lt $_);

          if($ssn eq $_) {
               close(SSN_FILE);
               &unlock("$file.txt");
               &display("$data/$file.html");
               exit;
          }
     }
     close(SSN_FILE);
     &unlock("$file.txt");
}
```

In order to run the CGI-Bin script for HTML files one must have the following command: print "Content-type:…";

'student' and 'faculty-staff' are the text files that contain the list of respondent's university identification numbers.

```
print <<EOT;
<HTML>
<HEAD>
 <TITLE>Error</TITLE>
</HEAD>
<BODY
 BGCOLOR="#EEEEEE"
 BACKGROUND="/IR/img/whitestone.gif"
 TEXT="#101070"
 LINK="#000000"
 VLINK="#303090"
 ALINK="#FF0000"
>

 <H1 ALIGN=center><IMG SRC="http://www.udel.edu/IR/img/udbanner.gif"
  ALT="University of Delaware"></H1>
 <H1 ALIGN=center>Environmental Attitude Survey</H1>
 <H2 ALIGN=center>An error occurred</H2>

 <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>

 <P>Your Social Security Number does not exist in our pool of participants.
  You may have incorrectly typed your SSN.
  However, if you did not receive an email notifying you of this survey,
  then you are not part of our pool and will not be allowed to enter.

 <FORM METHOD="post" ACTION="http://www.irp.udel.edu/CGI-Bin/ecc/survey.pl">
 <INPUT TYPE="hidden" NAME="try" VALUE=1>
 <P>Please re-enter your SSN to enter the survey
 <INPUT TYPE="text" NAME=ssn MAXLENGTH=9 SIZE=9>
 <INPUT TYPE="submit" VALUE="Sign On">
 </FORM>
```

print <<EOT; <HTML> is the command that creates an HTML document.

Access denied message written in HTML.

```
 <A NAME="sig"></A>
 <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>
 <TABLE>
  <TR>
   <TD><A HREF="http://www.udel.edu/">
    <IMG SRC="http://www.udel.edu/images/Logos/hm.gif" ALT="UD Home Page"></A>
   <TD><A HREF="../">
    <IMG SRC="http://www.udel.edu/IR/img/udir.gif" ALT="UD Institutional Research"></A>
 </TABLE>

 <P>
  Page updated: <EM><!UPDATED>29 March 1999<!/UPDATED></EM><BR>
  Maintainer: <A HREF="mailto:biell\@udel.edu">biell\@udel.edu</A><BR>
  Copyright &copy; University of Delaware: 1999.
 </P>

</BODY>
</HTML>


EOT

sub display {
	my($file)=@_;

	open(SURVEY, $file);
	while(<SURVEY>) {
		s/NAME="ssn" VALUE="x"/NAME="ssn" VALUE="$ssn"/;
		print;
	}
	close(SURVEY);
}
```

Once the students, faculty, and staff submitted the on-line survey, their university identification number was removed from the original survey respondent list and moved to a respondent-taken list. Next, their responses were immediately submitted to the database. The database of responses was verified for accuracy and then SPSS was utilized to complete the data analysis. The Perl program that performed this function is listed below[1]. This particular Perl program was the program utilized for the student survey. A separate Perl program was written for the faculty survey.

```
#!/usr/sbin/perl
eval 'exec perl -S $0 ${1+"$@"}'
	if 0;

my $data='/inet/www/dev/ecc';

require 'lib.ph';

my %list=fget_list(STDIN);
```

my $data= is the location of the CGI-Bin directory. The Perl and database files are located here.

Example of 'lib.ph' file shown previously.

```
my $ssn=$list{'ssn'};

my $ok=0;

my @entries=('Q1', 'Q2', 'Q3', 'Q4', 'Q5', 'Q6', 'Q7', 'Q8', 'Q9', 'Q10',
                'Q11', 'Q12', 'Q13', 'Q14', 'Q15a', 'Q15b', 'Q15c', 'Q16',
                'Q17a', ‘Q17b’, ‘Q17c’, ‘Q17d’, 'Q18a', ‘Q18b’, ‘Q18c’,
                                ‘Q18d’, 'Q19a', 'Q19b', 'Q19c', 'Q19d', 'Q19e', 'Q20',
                'Q21', 'Q22', 'Q23', 'Q24a', 'Q24b', 'Q24c', 'Q24d', 'Q24e',
                'Q25a', 'Q25b', 'Q25c', 'Q25d', 'Q26');

print "Content-type: text/html\n\n";
```

In order to run the CGI-Bin script for HTML files one must have the following command: print "Content-type:…";

```
&lock("student.txt");
open(SSN_LIST, 'student.txt');
open(NEW_LIST, '>student-new.txt');
while(<SSN_LIST>) {
     if("$ssn\n" eq $_) {
          $ok=1;
          next;
     }
     print NEW_LIST;
}
close(NEW_LIST);
close(SSN_LIST);
rename('student-new.txt', 'student.txt');
&unlock("student.txt");
```

'student.txt' is the text file that the program reads that contains the list of respondent's university identification numbers.

'student-new.txt' is the text file that the program writes to which removes respondents who have submitted an on-line survey.

```
&deny if(!$ok);

&lock('student.db');
open(DB, '>>student.db');
print DB $list{'gender'}, "\t", $list{'class'}, "\t", $list{'major'}, "\t",
     $list{'residence'};
foreach $question (@entries) {
     print DB "\t", $list{$question};
}
print DB "\n";
close(DB);
```

'student.db' is the database file that contains the respondent's responses to the on-line survey.

print DB is the command that writes all of the respondent's on-line survey responses to the database ('student.db').

```
open(SSN_TAKEN, ">>student-taken.db");
print SSN_TAKEN $ssn, "\n";
close(SSN_TAKEN);

&unlock('student.db');


print <<EOT;
<HTML>
<HEAD>
 <TITLE>Your survey has been accepted</TITLE>
</HEAD>
<BODY
```

'student-taken.db' is the database file that contains the identification numbers of respondents that have submitted an on-line survey.

print <<EOT; <HTML> is the command that creates an HTML document.

```
 BGCOLOR="#EEEEEE"
 BACKGROUND="/IR/img/whitestone.gif"
 TEXT="#101070"
 LINK="#000000"
 VLINK="#303090"
 ALINK="#FF0000"
>

  <H1 ALIGN=center><IMG SRC="http://www.udel.edu/IR/img/udbanner.gif"
    ALT="University of Delaware"></H1>
  <H1 ALIGN=center>Environmental Attitude Survey</H1>
  <H2 ALIGN=center>Thank you</H2>

  <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>

<P>Your Environmental Attitude Survey has been successfully submitted and you have been
entered to win a $25 gift certificate to RAINBOW BOOKS & MUSIC.

<P ALIGN="center"><STRONG>Thank you for your participation!</STRONG></P>

  <A NAME="sig"></A>
  <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>
  <TABLE>
    <TR>
      <TD><A HREF="http://www.udel.edu/">
        <IMG SRC="http://www.udel.edu/images/Logos/hm.gif" ALT="UD Home Page"></A>
      <TD><A HREF="../">
        <IMG SRC="http://www.udel.edu/IR/img/udir.gif" ALT="UD Institutional Research"></A>
  </TABLE>

  <P>
    Page updated: <EM><!UPDATED>29 March 1999<!/UPDATED></EM><BR>
    Maintainer: <A HREF="mailto:biell\@udel.edu">biell\@udel.edu</A><BR>
    Copyright &copy; University of Delaware: 1999.
  </P>

</BODY>
</HTML>


EOT

sub deny {
print <<EOT;
<HTML>
<HEAD>
  <TITLE>Your survey has been denied</TITLE>
</HEAD>
<BODY
 BGCOLOR="#EEEEEE"
 BACKGROUND="/IR/img/whitestone.gif"
 TEXT="#101070"
```

print <<EOT; <HTML> is the command that creates an HTML document.

```
 LINK="#000000"
 VLINK="#303090"
 ALINK="#FF0000"
>

  <H1 ALIGN=center><IMG SRC="http://www.udel.edu/IR/img/udbanner.gif"
    ALT="University of Delaware"></H1>
  <H1 ALIGN=center>Environmental Attitude Survey</H1>
  <H2 ALIGN=center>Survey not accepted</H2>

  <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>


  <P>Your Social Security Number does not exist in our pool of participants.
    Either you have already taken the survey, or you are not part of this
    pool.


  <A NAME="sig"></A>
  <P ALIGN=center><IMG SRC="/IR/img/gline.gif" WIDTH="100%" HEIGHT=4
ALT=""></P>
  <TABLE>
    <TR>
      <TD><A HREF="http://www.udel.edu/">
        <IMG SRC="http://www.udel.edu/images/Logos/hm.gif" ALT="UD Home Page"></A>
      <TD><A HREF="../">
        <IMG SRC="http://www.udel.edu/IR/img/udir.gif" ALT="UD Institutional Research"></A>
  </TABLE>

  <P>
    Page updated: <EM><!UPDATED>29 March 1999<!/UPDATED></EM><BR>
    Maintainer: <A HREF="mailto:biell\@udel.edu">biell\@udel.edu</A><BR>
    Copyright &copy; University of Delaware: 1999.
  </P>

</BODY>
</HTML>
EOT
exit;
}
```

The on-line survey and all of the associated files were stored on a secured web server that has access to the World-Wide Web (WWW). The server must have the ability to execute CGI programs. The CGI programs run the executable files. These programs serve a number of purposes: validate the respondent's access to the survey, help manage the incoming survey data, and reply to the respondent once the survey submission is complete (Schmidt, 1997). In this case, Apache served as the web server. The files that stored respondent identification numbers (.txt files), programming files (.pl files), and the actual database files (.db files) were located in a CGI-Bin folder. Due to the fact that CGI-Bin files create high risk and the possibility that anyone may input code, the CGI-Bin folder must be located on a secured web server where common users cannot gain access (Schmidt, et al, 1997). When creating public files "write" capabilities should always be disabled. Also, any time that multiple people access a particular site and have the ability to write to files, the file should be locked. The notation to lock files is provided in the first Perl program example, library of common routines and NT hacks. The HTML files were stored in a different folder on the secure web server.

Discussion

Certain aspects need to be considered when developing a web-based survey. These aspects include, but are not limited to, feasibility, biases, desired response rates, confidentiality, and paper versus electronic survey administration. Overall, many advantages are associated with web-based surveys. For example, time and money costs are relatively low compared to conventional survey methods, common data entry errors are eliminated, one may easily track the data collection process, and immediate access to the data is a reality (Schmidt, 1997). Money costs are kept low due to the reduced need for paper resources and mailing costs. Common data entry errors are eliminated because the respondent's perform the task of data entry.

On-line web surveys are subject to the same human subjects approval as paper surveys. For this reason, it was made certain that this particular survey received approval from the University's Human Subjects Review Board. This proved to be very important once the issue of anonymity was raised by some of the selected survey respondents. Survey respondents were required to enter their university identification number (a.k.a., their social security number (SSN)) in order to access the survey. A number of survey respondents felt that having to enter an identification number to access the survey established a loss of confidentiality. For this survey, respondents read the following statement before entering their university identification number: "Please note that this is a completely anonymous survey. You are requested to enter your SSN to gain access to the survey. Your SSN is not included in the respondent database and will not be utilized in any way during the analysis process. No attempt will be made to determine the characteristics of individuals, except for those demographics listed on the survey. Data will be analyzed and reported in aggregate form only." Even with a disclaimer some survey respondents did not like the idea of entering their SSN to gain access to the survey. The University utilizes SSNs as university identification numbers and this is the only unique number that is associated with each individual at the University. If it is at all possible, a unique password other than a SSN should be utilized as the respondent's identification number. It has been suggested that respondents could be required to answer a short screening questionnaire in order to gain access to the survey as well (Schmidt, 1997).

In order to help eliminate bias among the randomly selected respondents, the respondents should be informed that a paper version of the web survey is available if they prefer to respond to the survey in this manner. For this reason, a paper version of the survey may be developed as well. If a high response rate is a concern, it is suggested that a paper version of the survey be mailed to each randomly selected respondent and at this time inform them that they have the option to respond to the survey on-line. If respondents are notified about the on-line survey via email, only those that read email will receive the message. Distributing a paper version as well as an on-line version will ensure that you will reach most, if not all, of your randomly selected respondents. In addition, a pilot test for the administration of the on-line survey and the data collection process should be completed before the actual administration of the survey begins. This will ensure that the on-line survey is accessible to the selected respondents via their password, the surveys are being submitted to the data base, and the data collection program is running properly. Also, the on-line survey should be viewed on a number of different web browsers as the survey may look or behave differently depending on the browser (Schmidt, 1997).

Survey respondents provided feedback on the actual design of the survey. Respondents felt that the size of the text boxes supplied for comments was not sufficient. It has been suggested that the electric environment encourages individuals to be more self-absorbent and uninhibited leading to verbose answers to open-ended comments (Mehta, 1995). While the survey designer wants to ensure that respondents are able to develop their point, the designer must also be aware that this information is entered directly into a database and that the database may have capacity restraints.

Another concern is the HTML "radio" answer option, which may be utilized for yes/no questions. This option permits respondents to choose one answer value and one answer value only. The problem with the HTML "radio" answer option is that once you choose a answer value, you may toggle between the answer values that are displayed but you no longer have the option to not answer that particular question. For this reason it is important to have a "Don't Know" or "Not Applicable" answer value. The HTML "checkbox" answer option utilized for multi-response, on the other hand, allows respondents to choose as many of the answer values as they like.

Survey respondents provided considerable amounts of feedback on the administration of the on-line web survey. Contacting the selected respondents via email and administering the survey on-line proved to be a very interactive process. Respondents readily expressed their approval or disapproval of the survey and being contacted to participate. Respondents also provided many helpful comments.

Conclusion

Overall, the University community was receptive to the administration of an on-line survey. Time, costs, and resources were minimized utilizing this method of survey administration. This particular web-based survey simplified the data collection process, required minimal data entry, and allowed the data analysis process to be completed in a more timely manner. For this particular project, the advantages of administering an on-line survey versus a paper survey far outweighed the disadvantages.

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Endnotes

[1] The Perl programs were authored by William Totten, a graduate student in computer information sciences who was employed by the Office of Institutional Research and Planning at the University of Delaware.

ELECTRONIC FACT BOOK: A REALITY OF TODAY

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Institutional Research Offices are often inundated with projects, some of which are recurrent in nature, while others are just one-time challenges. A small question to a large report requires a retreat to many complex institutional databases for answers. The researchers are thus left with their best critical thinking skills to find out ways to economize yet retain efficiency in their working situations. While the growing needs of the office require additional personnel to carry out routine and complex jobs, constant decreases in funding, increased legislative queries, downsizing and privatization do not make the job easier. On the other hand the fast paced technology is offering simplified solutions that were unthinkable not a long time ago which implies that the future success of a research office lies in the ability to serve as complex information brokers using cutting edge high technology tools.

It is interesting to know how the presentation and dissemination of the information has changed due to the presence of Web. There has been a revolution in the infrastructure of the information due to it and it forces Institutional Researchers to envision it's most effective usage. With this background, the Institutional Research Office at Union County College (UCC) decided to initiate its presence on the web via its Common Data Set and Fact Book. The present paper includes a brief background on the Fact Books, their advantages, need for an electronic Fact Book, issues associated with Fact Book and software used in designing web pages.

Background

Way back in 1867 the US Office of Education published a document entitled "Statistics of Land-grant Colleges and Universities", a well accepted document that quantified and summarized information that was required by many offices and departments. The information was collected regarding students, degree, faculty and finances in higher education. The document was intended to increase efficiency of the office by reducing redundancy and answering to diverse audiences at the same time. Later many institutions joined the trend and came up with Institutional Fact Books which helped them perform multidimensional tasks in a single project. Some institutions did the project every year while others did it every second year or so as per their institution's requirements. However, some institutions did not go for it because of the cost and time associated with it.

Fact Book and Its Advantages

As the name suggests "Fact Book" is a collection of basic facts about any entity in one place. The objective behind the Fact Book is to collect relevant information in any one place that helps in decision making, communication and planning, while serving as an excellent source of comparison. It allows meaningful interpretations, trends analysis and reviewing of the information.

Fact Book allows the researchers to use their creativity in accumulation and presentation of the opulent information of the institution. For this reason Fact Books are found in various shapes and sizes, with plain data, colored graphics, pictures etc. However, the goal remains the same, i.e., to collect relevant information in one place. Following are some of the advantages of a Fact Book:

1. Data Resource. Fact Book is a resourceful document that summarizes current and historical data about the organization. But more important, the data is reliable, consistent, uniform, comparable and confirms to the national/regional data definitions.
2. Decision Making. Fact Book provides reliable base-line data, trend data and comparative figures required for inquiry and analysis by decision-makers. It helps researchers to provide information in one document to a diverse group of decision-makers across institutions.
3. Planning. Fact Book provides information to planners who are continually trying to see where they were years ago, where they are now and where they could be tomorrow. The trends in Fact Book data assist them to carve a better future for the institution.
4. Self Study. Fact Book has been found to be very valuable report in the accreditation process. A Fact Book provided to the accreditation teams, prior to their visit, helps them understand the institution better.
5. Communication. A Fact Book provides the user a communication means to the audience. It links to communicate a range of direction, i.e., to "link diverse groups into a natural commitment towards the advancement of the total institution".

Need for an Electronic Fact Book

The fast pace of technology is changing the mode of many institutions. It has already created it's impact in the work places and has allowed the users to perform a multitude of functions easily and in less time than ever before. More and more institutions seem to be connected on-line, i.e., services are being provided to the students on-line, modes of delivery are on-line and so on.

In his book "Being Digital", Nicholas Negroponte (1995) has rightfully stated that the fundamental particle for the information age is no more an atom, but a bit. As more and more of the world's infrastructure is built, much of the information we get, i.e., text, images, sound and video, is being delivered by bits. In it's simple form an electronic Fact Book is the paper bound Fact Book displayed on a computer screen. Michael

Marontette (1995) suggests that an electronic Fact Book functions as a campus wide information source. Any user who is interested in general information about the institution can access the electronic Fact Book and obtain information. So the access is easy and wide. Some of the advantages of an electronic or on-line Fact Book are:

A. Fact Book as a Marketing Tool. Due to its wide and easy access, a Fact Book can be considered as an excellent marketing tool. Prospective students, their parents, donors, potential faculty and the general public can access the electronic Fact Book to get the information they need.
B. Decision Support Tool. The dynamic electronic Fact Book can supply institutional executives, college and department administrators or IR professional instant information for decision-making purposes.
C. Management Reporting Tool. Reports can be produced using the electronic Fact Book that would impact on the institution's operational procedures.
D. Dynamic Information. The information in the paper bound Fact Book may be year old but the electronic Fact Book can be updated quarterly, monthly, weekly or as the new information is obtained. So the most current information is accessible.
E. Display Format Preference. Various display formats are available with the electronic Fact Book i.e., print, read or download.
F. Cost effective. The costs associated with paper, printing and mailing are totally saved here. Once the Fact Book is on the web, marketing it in the college paper, newsletter etc. would help people to access it.
G. Available Anywhere Anytime. The on-line data is available anywhere anytime provided the tools, i.e., a computer, a decent browser and a modem are available to the user.
H. Time Saver. The bits are transferred faster or slower depending on the hardware of the computers but it is certainly faster than an interoffice request.
I. Friendly Browsers. The latest user-friendly browsers guide the person to what he/she is looking for.
J. Multimedia Capabilities. The multimedia supporting capabilities allows one to add color, picture, sound, and video to your Fact Book that makes it interesting.

With such advantages to support the project, the research office at UCC decided to put their Fact Book on the World Wide Web. However, even before the Fact Book, the IR office at UCC posted the "Common Data Set" on the web, which was an exciting and successful venture. The Fact Book was perceived like the "Common Data Set", as both involved information transaction either in the form of a hard bound report or a simple response to an internal or external questionnaire received by the IR Office.

It is well known that IR offices are expected to fill out innumerous questionnaires that are basically collecting the same information with a few questions specific to them. Like other institutions, the Institutional Research Office at UCC was also involved in filling out these innumerous surveys. Therefore the collective efforts of College Board, Peterson's, Wintergreen/Orchard House and US News in producing the "Common Data Set" was perceived as a very positive step by the IR office. Though the "Common Data

Set" was still in the evolving phase it's earlier version was manipulated to suit the Community Colleges and with the help of Microsoft FrontPage software it was published in the cyberspace. It was observed that the external agencies were agreeing to take the information from the home page, thereby, sparing the agony of filling redundant forms. The next step was then to publish the on-line Fact Book.

The model for the on-line Fact Book was based on the colored Fact Book that was published during the Middle States re-accreditation team visit. The sections were categorized as: admissions, enrollment, degrees conferred, faculty, finances, facilities, instruction, financial aid and alumni. The on-line Fact Book had four sections i.e., enrollment, faculty, degrees conferred and alumni. The reason for having fewer sections was partly because they were most useful to consumers, and that some of the finest graphics and pictures were associated to them. Also, one had to be sensitive to the fact that the audience now changed from the college community to practically the entire world. As we shall discuss further a combination of software was used to publish our Fact Book on the web.

Issues Involved in the On-line Fact Book

Some of the issues involved with on-line information are as follows:

1. Audience. It is evident that the audience is changed with the on-line Fact Book. The on-line information is accessible to the entire world so the information needs to be scrutinized carefully for content and it's interpretability.
2. Content. As a marketing tool most people outside the institution are assumed to be interested in the programs offered, enrollment, degrees obtained. However data regarding finances or comparisons among peer institutions are complex and require critical thinking so as to avoid any unnecessary misinterpretation. What information should be on-line needs careful attention.
3. Maintenance and Updating. The paper bound Fact Book was updated by the researcher at regular intervals. However, with on-line Fact Book it may not work the same way. A responsible and trained individual is required to update the information as and when required. Some data may be updated annually while other information may require constant updating.
4. Space Utilization. As the department goes on-line a certain amount of space may be allocated to them for the homepage. The researcher has to clearly think about what should be on the web. Avoid redundant information and stress on meaningful and efficient information. The allocated space may not be large enough for everything that you have in the paper Fact Book therefore some selectivity would be required.

5. Software. Selecting software is very critical to the building of any on-line document. Though initially researchers had to learn Hypertext Markup Language (HTML) or a language that would convert information into on-line format, currently there are software like FrontPage, Home Site, BBedit, pagemill etc. that help in publishing the document on-line. However, a working knowledge of HTML is certainly helpful.

Software Support

One crucial question faced by the new user is where to start, what is available and how much training is required. Though the importance of HTML language cannot be ignored in designing a web page, Microsoft and others have provided various software that are amazingly simple and user friendly. They usually require minimum training and provide fascinating results. A new user is advised to make full use of the free web publishing material that is available on the web and then explore the range of software available that is best suited to their needs. A list of tools that may be helpful to the user are categorized as follows:

I. HTML Primer

The Hypertext Markup Language or HTML is the basic language that is used to attribute documents on the World Wide Web. Though the new web publishing tools are helping the user to create web sites without directly using this language, a basic knowledge of this language is definitely helpful in understanding the web structure of your material. Some of the references for accessing the documents are:

1. A Beginner's Guide to HTML:
   http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimerAll.html
2. The HTML Quick Reference Guide:
   http://kuhttp.cc.ukans.edu/lynn-help/HTML-guide.html
3. Complete Guide to HTML:
   http://www.emerson.emory.edu/services/html/html.html
4. The Bare Bone Guide to HTML:
   http://werbach.com/barebones

II. Web Authoring Tools

1. FrontPage '98 - is a virtual client/server web publishing document from Microsoft. The editor provides WYSIWYG editing, built in spell check, and easy creation of links and clickable images, form creation and image type conversion etc.
2. Home Site - generates a "pure HTML" unlike many WYSIWYG tools. It has a clean interface, color coded tags, spell checker and built in FTP service.
3. NetObject TeamFusion - is a site oriented application that gives unprecedented visual control over the design and production of the entire web site. It's one of the first applications that combine automatic site building, professional quality design and data publishing features.
4. BBEdit 5.0 - is a Mac text editor that includes HTML syntax, spell checker and link checker as well as the usual array of tools to automate mark up.
5. Adobe Page Mill 3.0 - has a WYSWYG interface, drag and drop page creation mode, integrated site management features with search and replace capabilities including over 10,000 web ready images and animations.

6. Microsoft Office '97 - provides the capability of producing software in Word, Excel or PowerPoint that can be saved in the HTML format, i.e., easily usable in any of the above software.

III. File Transfer Software

1. File Transfer Protocol (FTP) software - is used to post the document on the web site so that it can be viewed by any browser.
2. FETCH – is a software that can be used to post web pages from MAC to the remote web site.

IV. Graphic Software Composer

1. Image Composer/Corel Draw - provides effective visual display and requires image editing software like Image Composer that comes bundled with FrontPage, Corel Draw, Paint Shop Pro and Adobe PhotoShop.

V. Multimedia Capabilities

Royalty free clip art gallery from Corel called Image Gallery can be used for image/audio/video clip arts. The sound segments can be edited using sound-edit16 sound forge software. The video segments can be edited using Adobe Premier. A collection of sound clips from Musicopia provides enticing audio clips in WAV and AIFF format.

Union County College's On-line Fact Book

The IR office at Union County College worked in two phases to create their on-line Fact Book. Though initially FrontPage was used as the primary web Authoring tool to create the web site, not long after the site was reconstructed using NetObject TeamFusion to maintain consistency with the other institutional sites. The entire process can be summed-up in three phases i.e., planning, constructing and posting.

I. Planning of the Web Site - involved learning, research and delineating the information that was deemed necessary to be posted. A workshop on web at NEAIR and HTML primers were used to understand the concept of the web page. However, it involved further research in terms of what was already published and how people perceived the end product. Research was also involved in finding free graphics and images that were available on the web and could be used to enhance our web site. The planning process also entailed understanding the site structure, links and attributes, i.e., images, sound etc. that accompanied each page. Exact, updated information with graphics and links was printed and discussed. Finally a draft was ready to be replicated by the Web authoring tool for the web site.

II. Constructing the Web Site - involved transforming the paper bound ideas to the reality of the web page that could be viewed by any browser. This was also done in two phases, i.e., using FrontPage and NetObject TeamFusion Software. The data with charts and graphs already existed in Microsoft Excel software and to save time and efforts it was decided to transform the files from Excel to HTML format directly. One of the features that has been added to Office'97 is an easy conversion of Excel documents to HTML format files. So the selected tables, charts and pictures were converted and saved as HTML and GIF files. These HTML files were then imported to the Microsoft FrontPage '97 software. It should be noted that the graphs and pictures were saved as GIF files, i.e., they are saved as images and the tables are HTML files (with extension *.HTML or *.HTM). The next step involved cleaning the tables and activating the images. The tables were resized to fit the space available at a screen resolution and modified with borders etc. The graphs and images, however, presented a different problem. They were captured from the Excel platform with a certain size and so they had to be re-sampled. Corel Draw allowed the pictures to be re-sampled and so they were resaved and added to the page. Some of the pictures/maps of UCC, New Jersey and the USA were also added to the page and information had to be imposed on them. So the Image Composer software was used and the numbers or words were added to the picture/maps. Appropriate links were provided and tested to make sure they were working. Animation and images were added to the page to make an attractive appearance. Microsoft FrontPage software is a user-friendly software which allows one to easily create their web pages, and view them, on the browser simultaneously to see the desired effect. A simple tutorial will allow the user to create a simple page in a matter of days. However, a few limitations were encountered, especially in formatting the document, which the user overcame with the use of HTML basic language. Improvements have been made in the latest version of FrontPage i.e., '98.

The second phase was encountered after approximately a year when the college decided to give a consistent look to the entire college homepage using NetObject TeamFusion software. This in essence meant that the IR site had to be transferred from the local vendor site to the college server and make it consistent with the design chosen for the site. As a result the IR web pages were transferred on the server and reorganized. The reorganization occurred in reference to the space available for the actual page on the site since master borders and labels were added. The other changes included color scheme, background, adding indexes, resizing and re-sampling tables, charts, pictures and maps. New graphical motifs were designed to enhance the meaningfulness of the site and lot of experimentation occurred. The links had changed now so they had to be reset and re-tested so that they worked well on the browser. The result was consistent and exemplary. As one of the aims was to make the site more appealing and interesting to the viewer, music was added to each page which could be enabled or disabled at the viewers request and the page was ready to move.

III. Posting of the Web Pages - In phase I when the web page was created using Microsoft FrontPage software the files had to be imported to the site server using file transfer software. Therefore, the File Transfer Protocol or FTP software was used to send the files to the site and tested.

NetObject TeamFusion has the in-built capability of posting pages to the server without use of the FTP software and so once the previewed pages were found to be satisfactory they were posted to the site assigned to the IR office and were ready for the world to be viewed.

To view our Fact Book go to:
http://www.ucc.edu/assessment/admin/fact_book.html

THE ANALYSIS OF THE GENERAL STUDIES CURRICULUM AT A PUBLIC URBAN UNIVERSITY: WHAT WORKED AND WHAT DID NOT

Arthur Kramer, Director of Institutional Research
Ansley W. LaMar, Dean of the College of Arts and Sciences
New Jersey City University

Introduction

Since the mid to late 1970's, the general education curriculum in colleges and universities across the United States has become an item of concern for higher education faculty and administrative staff. One reason has been attributed to greater competition for students. This resulted from factors such as the last "baby-boom" students having already become of college age, which caused struggles for survival by public and private institutions of higher education that were established to accommodate them, and an influx of more under-prepared students seeking college admission (Kanter, Gamson, and London, 1997). Also noted is the establishment of an "national agenda" for higher education published in higher education periodicals and spoken of at regional and national conferences (Kanter, et.al. 1997). Added to this was and economic slow-down during the 1980's which resulted in a "drying up" of the flow of Federal and state funds to public institutions. This led to a greater emphasis being placed on accountability for the products of the funds that were given for higher education (Kanter, et.al. 1997), i.e., the institutions were being held accountable for what their graduates knew and could do.

These phenomena resulted in questions such as "What should an educated person know?" and "What should a person with a college degree know how to do?" Applied and professional degree granting programs have specific career-based criteria established by accrediting agencies with which to assess specific knowledge and abilities, but they do not address what it means to be an "educated" person.

Once there is institutional agreement over the goals of a general education curriculum (which is no mean feat itself!) the problems of assessing and evaluating the program arises. The *Differential Coursework Methodology* (Ratcliff, 1988) utilizes standardized tests and course-taking practices, as revealed in analysis of graduates' transcripts, to evaluate student learning among the majors offered by an institution. But the generalizability of the results has been questioned (Pike and Phillippi, 1989). The value of tests like ACT's COMP and ETS's Academic Profile over institutionally constructed, "home grown", tests must be determined, as must the utility of administering a standardized test over using proxy measures, such as, student self-reports (Pike and Phillippi, 1989). Plus, there are other components of a good overall assessment strategy such as assessing the focus of the program, the manageability of the methodology, keeping the process on track, and administrative support (Smith, 1993).

Beyond what is mentioned above, there are special problems that have been associated with urban institutions. Their mission statements typically talk about providing access for under-served populations and serving diverse student populations, but there are disparities within that segment of institutions, especially in regard to development of programs and facilities, (Kinnick and Ricks, 1990), which reinforces the question of appropriateness of standardized tests.

The current study explicates a process used to assess the general education component of the undergraduate curriculum at an urban university. Emphasis is placed on the components of the methodology that provided data useful for suggesting changes to the program, and the aspects of the process whose data or procedures did not provide viable data.

The institution

The present study was undertaken at an urban institution—urban because we are situated in a community of about 200,000 to 300,000 people in the New York metropolitan area. The undergraduate population hovers around 6,000. Our total population is about 8,000—graduate and undergraduate. This paper discusses what worked and what did not work in our analysis of our general studies curriculum; where we got some useful data, and which parts of the methodology gave us less than useful data. It also describes what we would like to do again, and what we will not do again because, in all likelihood, we will be doing something like this again. It's not a dead issue

One aspect of the project should be noted—there was a deadline of December of 1997 to complete the analysis, a timeline of approximately one year from development to report distribution. The faculty senate wanted the report; the administration wanted the report.

The program that was in existence was comprised of 66 credits:

All college requirements (12 s.h.)
    The Requirement in English Communications (6 s.h.)
    The Requirement in Mathematics (3 s.h.)
    The Requirement in Career Exploration (2 s.h.)
    The Requirement in Computer Usage (1 s.h.)

Core curriculum (12 s.h.)
    Area 1.
        Science (3 s.h.)
        The Science Experience
    Area 2.
        Social Science (3 s.h.)
        Introduction to the Social Sciences

Area 3.
    Fine, Performing, Creative Arts (3 s.h.)
    The Artistic Experience
Area 4.
    Humanities (3 s.h.)
    Introduction to the Humanities

Distribution component (30 s.h.)
    Area 1 Natural Sciences (6 s.h.)
    Area 3. Fine, Performing, Creative Arts (6 s.h.)
    Area 4. Humanities (6 s.h.)
    Area 5. Communications and Contemporary World (6 s.h.)

Advanced electives (12 s.h.)
    200, 300, 400 level courses

Method

Analysis of graduate transcripts

The first component of the analysis looked at graduates' transcripts by looking backwards at cohorts and analyzing their course sequences. We looked back on seven cohorts from 1990 to 1996. There were two reasons this was performed. The first was to get an idea of the course taking practices within majors to see if clusters of General Studies courses were common within the majors and analyze student performance on some discreet test in accordance with The Differential Coursework Methodology (Ratcliff, 1988).

The second component was to assess compliance with the University policy on course sequence enrollment. The policy states Core Courses and All College Requirement (e.g., composition and math, and introductory natural and social sciences) are to be taken within the first sixty-four credits completed. Because the University is situated in an urban environment, many under-prepared students enroll, as do many who require English as a second language courses. These students were eliminated from the analysis.

Analysis of syllabi

The next phase of the analysis was the analysis of syllabi, which was coordinated by the Dean of Arts and Sciences. Syllabi of faculty teaching General Studies courses were requested by the Dean who then sent them to the chair of a Faculty Senate committee for analysis. The analysis involved each syllabus being scored by three members of the committee—an effort to achieve inter-rater reliability on the general studies content contained in the description(s) of the course requirements. Syllabi were judged for references to critical thinking, writing, reading, oral presentation, computer, and mathematical skills in the tasks required of their students. So if they set it in their goals and objectives and then had that within their homework assignments or in their classroom assignments and the students would be doing these things, they would be getting either a one or a three. So we'd score it as either a zero if there was no reference to it or a three that there was a great deal of reference to these criteria.

Course audit

The course audit was a questionnaire sent to faculty. The instrument contained questions asking the faculty of their agreement with the goals of the general studies curriculum and whether they thought those goals were appropriate and achievable. The respondents were required to select from five-point scales their degrees of agreement with the statements of the goals.

Academic profile

The desire was to get representative percentages of the "native" students, (those students who started their post-secondary education at our university) who were freshman, sophomores, juniors and seniors to take the test. We offered a $25.00 gift certificate to Barnes and Noble as an incentive to come for the test. Time frames were established and letters sent to students telling them a time had been scheduled for them to come in to take the test. The initial response rate was very poor, even with the incentive (about 25 students responded). Subsequent invitations were sent to all native students on campus; approximately 3000 letters asking students to tell us when they could come for testing—this resulted in a sample of 249 students.

The Academic Profile comes in two forms. A long form, which yields information on each individual student, and a short form, which takes less time to administer but only gives institutional data. This form "cycles" the information among the test booklets so that a sample of test content is given to each student. The samples are later aggregated into an institutional score. The Profile contains an optional writing sample, which we chose to administer. ETS scores the Profile and returns the scores, by class level, obtained on the skills and abilities the instrument tests. The writing sample is generally scored by the institution.

Institutions using the Academic Profile are permitted to select from colleges and universities that have used the Profile, a number of institutions for comparative purposes (those scores are aggregated and comparisons are made to the aggregate scores, not individual institutions). To that end, institutions on the ETS list were selected using information in the IPEDS database, for comparative purposes.

Survey of faculty and staff

A survey questionnaire developed through a joint effort of the Office of the Dean of Arts and Sciences and the Office of Institutional Research. It was mailed in June 1997 to faculty who taught general studies classes in the previous semester. The questionnaire contained five sections. Three sections utilized five-point rating scales (Likert scales), a fourth section scale contained question with three response options, and the last asked questions about respondent characteristics—department, employment status and rank, and general studies courses taught.

Results

Analysis of graduate transcripts

The task of assessing by computer differences among the majors turned out to be a daunting one since many students change their majors during their college career. For example, a student may initially claim a natural science as a major, take an introductory course (or two), and then change majors to a social science. The student might then apply the introductory major course(s) to the general studies requirement.

It was possible, however, to obtain data about core course and all college requirement (ACR) enrollment activities through computer analysis of transcripts. The records of students who graduated between 1990 and 1996, delineated by class-level (i.e., the first 32 credits counted as their freshman year; 33-64 their sophomore year, etc.) were analyzed to assess the proportion of credits earned within the various general studies areas among the class-levels. The findings demonstrated that in the earlier years students tended to take fewer general studies courses during the first years of their college career. In subsequent years the enrollment policies were more closely adhered to and students were taking more general studies courses. These analyses controlled for the number of students taking remedial and English-as-a-second-language courses.

Analysis of syllabi and course audit

The list of courses and their respective scores on the skills was tabulated. The total score per skill for each syllabus (range of possible scores was 0-9 if the syllabus was read three times—occasionally a syllabus was read more that three times) was entered into one table. (table 1), and percentages of the total possible score, depending on the number of times a syllabus was read, was entered into a second table (table 2).

Table 1 List of Syllabi and Skills Found[1]

Table 2 Average Percent of Skills Found per General Studies Area

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[1] Tables, figure, and appendix referenced in this article may be obtained by contacting the authors.

Academic profile

The test consisted of two major components. The first, a 36 item multiple choice test; the second a short essay. Scoring of both sections was performed by ETS. A full-scale score was reported for each student, but not a score on each individual general studies skill or ability. A writing level score for each student resulted from the essay. The full-scale score was based on a standardized range of 400-500, with a standardized mean of 450. The institutional subject area scores were aggregated within class levels. These were based on a standardized range of 100-130, with the mean standardized at 115. ETS supplies comparative statistics derived from test results from other institutions that have utilized the instrument. Those results are reported in accordance with the Carnegie Classification conventions: comprehensive colleges and universities, liberal arts colleges, research/doctorate universities, and two-year colleges and technical institutions. Within those categories, data are provided for freshmen, sophomores, and upperclassmen. The descriptive statistics for students were reported along with a 95% confidence interval so that an estimate of total freshmen, sophomore, junior, and senior scores could be made. ETS advises against comparing scale scores among the separate scales, e.g., not to compare Humanities scores with Social Science scores, but states that comparisons across class levels are appropriate. An example of how a general studies content area, Humanities, was reported, is contained below.

Survey of students

A survey was administered using a randomized block design to a sample of general studies courses during the spring 1997, semester to ascertain the students' impressions of the current general studies program. Three hundred fifteen students completed the questionnaire. The survey questionnaire was made up of five sections. The first asked the students if they thought the program's goals were relevant and if the goals were achieved. The second section asked about specific goals of specific courses and if the students felt the course achieved the stated goal. The third section asked the students if they agreed with the policies and guidelines of the general studies program. The third section asked the students their opinion of the adequacy of the distribution of general studies credits. The last section asked about overall satisfaction with the program. There were also demographic questions such as total credits earned, total gpa, and academic aspiration of the students.(A copy of the survey instrument is contained in the appendix.)

Results were reported as descriptive statistics (means, standard deviations, medians and modes) of the Likert scales for each item (table 3).

Table 3 Responses to Student Satisfaction Survey's 5-Point (Likert) Scale

There were also several questions that required categorical responses. Questions such as, "Have you completed the computer as a tool course?" The responses to these questions were reported as SPSS "Frequencies" output.

Survey of faculty and staff

One hundred and eighty-nine questionnaires were mailed, 73 usable responses were received resulting in a response rate of 39% (the questionnaire is contained in the appendix).

The highest level of agreement over what is an appropriate goal is to improve students' ability to communicate clearly. The lowest agreement is with the goal to improve students' ability to ask wisely. In an analogous fashion, the responses to the statement of achievability were reduced and tabulated. The most agreement was obtained over the achievability of offering opportunities to achieve an awareness of social problems and structure.

There was general faculty agreement that remedial reading and writing should be completed before the core courses are taken; there should be continuos involvement in the College's writing program until completion of Fundamentals of Communications II is completed; and, that all general studies courses should require reading and writing. The highest level of agreement was with the policy of requiring reading. The lowest level of agreement was with requiring completion of all ACRs and 35 general studies credits before declaration of a major.

Most respondents felt the 12 credits of core and 12 credits of advanced elective requirements were sufficient. They also felt the 30 credit distribution and 66 total credit requirement were sufficient, and that the three credit math and six credit English requirements were enough.

There was a section overall asking about overall satisfaction with the program. The responses did not reflect strong agreement or disagreement with statement that the program is meeting it goals or needs revision. But there was general agreement that the program was providing a good liberal arts and sciences education and was meeting its goals. There was general disagreement with the statement that the program did not need revision. However neither case reflects a majority opinion.

The last section asked information about the respondents—their employment status, department, years of employment, and the category(ies) of general studies courses taught. Most of the respondents were full professors. The average amount of time at the University was 18 years (median 20; tri-modal at 1 year, 25 years, and 30 years; the distribution was negatively skewed with a 36 year range—minimum 1 year, maximum 37 years); the most highly represented department was English (13 respondents). Half of the respondents have taught an ACR course, 60% had taught core courses, 80% taught distribution courses, 70% taught advanced elective courses.

Administrative analysis

This phase of the study was terminated due to the confounding characteristics of the number of courses listed as general studies area courses and the habit of substituting courses when students change majors. This problem is similar to the one encountered in the transcript analysis.

Discussion

Most of the project produced useful information, however several components proved to require more time than was allocated to carry out the complete design. The transcript analysis and the administrative analysis are the instances in which this was the case.

Course audit and analysis of syllabi

The course audit provided some interesting data about how general studies courses were addressing, or failing to address, the University's general studies goals. A problem associated with this phase of the analysis, though, is that a goal may be addressed in the actual activities of the course, but not be presented in the syllabus, or vice versa. For example, a syllabus may not state that students are required to submit a paper that has been created with the use of a computer word-processing program, but the faculty member assigning the project requires the paper to be produced in that fashion. Or, the degree to which critical thinking is required within the context of the class-work and assignments cannot be stated in the body of a syllabus.

Although syllabi have been requested each semester, one hundred percent compliance has been a problem. Plus, adjunct instructors taught about 30% of the general studies classes and reaching them to obtain their syllabi has been a problem historically. A new time frame is being enacted within which the request for syllabi will go out to faculty in the beginning of the semester, rather than later. It was felt that issuing the request during the middle of the semester caused faculty to have to reprint syllabi, but in the beginning they already have copies in-hand. This is compounded by the fact that the University's culture is unaccustomed to assessment. As we move forward with our assessment initiatives this problem should be eliminated.

Transcript analysis

To do a transcript analysis is a time intensive project necessitating, at some level, individual analyses of paper copies because decisions concerning course applicability are required. Because of this, this component had to be abandoned. Would we do this again if time permitted? We most likely would. Especially utilizing something like the academic profile or a "home grown" objective test. Valuable information can be obtained via cluster analysis, discrimanant analysis, or other analytic means, be they quantitative or qualitative, to discern the course taking practices within the majors. As a matter of fact, a new general studies curriculum has been proposed incorporating an assessment methodology consisting of an instrument developed “in house”.

Academic Profile

There are advantages and disadvantages to using a pre-made standardized test of general education. Among the advantages are the ability to compare your students' results to students from other institutions who have taken the test; you get the product of the expertise of a sophisticated staff of test developers; and, you do not have to score the results. But, the ability to compare your students with those at other institutions results in a time consuming, tedious task, especially if you try to select institutions with which to compare yourself. For the present analysis, selecting comparable “sister” institutions from the list provided by ETS required searching the National Center for Education Statistics database of IPEDS (Integrated Post-secondary Education Data System) data for qualities that matched our institution's. For example, Carnegie classification, control, ethnic breakdown of students, general and educational expenditures, and campus location all had to be considered in the process.

Furthermore, in using a standardized test, you cannot be sure the test has been constructed to weight the various components of general education in the same proportions as your curriculum. For example, the test may place a great deal of emphasis on western civilization in the test of humanities, whereas your curriculum places more emphasis on the international components of world history.

Survey of students

This information can be helpful in understanding the students' feelings about general education, their impressions of the way the content is being delivered, and their overall satisfaction with the program. Just as freshman surveys can identify changes in incoming students, this type of information can alert you changes in student academic goals.

Survey of faculty and staff

The importance of this is similar to the importance associated with student satisfaction with the program. Clear statements of the goals of the program and of whether the perception is that the goals are being obtained will lead to an understanding of the effectiveness of the program and how soon major changes are going to be called for. If this survey is performed on a regular basis, though, major changes should not be called for because the program will continuously be adjusted to conform to the desires of the students and faculty/staff, as per the results of the surveys.

Major problems experienced in carrying out this phase of the analysis had to do with timing and communication, which led to the survey being administered twice and data being sent to more than one place. The survey was initially administered in the latter part of the spring semester, when faculty members were preparing for finals or grading papers. Plus, the initial survey was carried out through the Dean's office, which may have precipitated reticence to comply on the part of some faculty. It was felt, at the end of the semester, that a better response rate was obtainable by mailing the surveys during the summer to faculty homes with a stamped self-addressed envelope returnable to the Director of Institutional Research. The thought did not occur to the researchers that some faculty might be away and unable to respond, or that others who had previously responded would not respond again, even though they were asked to do so in the cover letter.

Conclusion

Optimal use was not made of all the data collected. Part of this can be attributed to the time frame provided to re-design the program; and some is attributable to the mixture of perceived purposes of a general studies program. The surveys of students, faculty, and staff can help an institution identify its own definition of general education and assist in formulating policies in its administration. Content tests can provide an understanding of whether the material is being learned by the students, and transcript analysis can result in 1) an awareness of the effectiveness of the policies, and 2) identification of major program curricula that do better at providing support for the general education program. This type of multi-faceted analysis will give a complete picture of the effectiveness of the program and the satisfaction with it on the part faculty and staff. Add to this an administrative analysis comprised of use of funds apportioned to support the program and faculty involvement, and a complete planning and assessment package can be developed.

One aspect that was not addressed in the assessment methodology, which was brought up afterwards, is eliminating fear and developing trust on the part of all concerned. A suggestion of keeping the activities public and the rationale for the activities has been voiced and will be explored in future assessments.

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MEASURING STUDENT SUCCESS IN REMEDIAL EDUCATION PROGRAMS

A Case for Using a Modified Version of the Student Right to Know Methodology with Eight Criteria for Measuring Student Progress Along the Way

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According to the *National Center for Education Statistics* at the U.S. Department of Education, an average of two-fifths (41%) of the freshman in public 2-year colleges were enrolled in one or more remedial courses in Fall 1994. At Westchester Community College during the same semester, nearly half (47.6%) of the first-time credit students were enrolled in one or more remedial education courses. Moreover, Westchester Community College and virtually all public 2-year institutions in the country offer courses in remedial reading, writing, and mathematics.

With such a heavy (and growing) investment in remedial education by both faculty and administrators, the quest for a means to measure the success of these programs becomes all the more urgent. This paper presents an argument for using a variation of the *Student Right to Know* methodology using eight criteria to measure student progress along the way.

Methodology

When it comes to measuring *student success* in remedial education, much depends on what one wants to do with the information. At the very least most academicians want to know how their remedial education students fare over a number of semesters, and whether they graduated or transferred to a four-year college. Chances are they also want to know the *trends* at their own college over a number of years. Are more or less freshmen requiring remedial education courses? Are more or less passing these courses? Are more or less moving into credit bearing courses? Are more or less completing credit courses? Are more or less graduating and/or transferring? These are the kinds of questions that arise when college faculty and administrators begin to evaluate the success of their remedial education programs.

Moreover, in most cases, the need to measure *student success* does not stop here. Sooner or later a college will want to (or be asked to) compare itself to other community colleges in the state and eventually to other community colleges in the nation.

Cohort based tracking: Once ***trends*** over several semesters are desired, or once ***comparisons*** with other colleges are needed, cohort based tracking provides a methodology for tracking *student success* that avoids the problems of apples and oranges.

Cohort based tracking involves identifying a group of students all of whom enrolled at a college the same semester for the first time. They are then tracked over a given number of semesters to see how well they fared. To eliminate other apples and oranges problems, students in the same cohort must share certain other characteristics such as being enrolled in a program of the same length, or not having *transferred-in,* with credits from another college.

When it comes to specifically measuring remedial education students, however, several characteristic of this group argue for some variations in the methodology used for the *Student Right to Know* cohort. They include the following:

Track Over Four Years: Remedial education courses at most community colleges are non- credit bearing. It stands to reason, therefore, that graduating in the normal length of time (two years) is highly unlikely for these students. It also stands to reason that the normal length of time allotted by the *Student Right to Know* guidelines to track students (3 years or 150% of the normal time it takes to graduate) is unrealistic. Instead, it is recommended that these students be tracked over four years or 200% of the normal time it takes to graduate.

Include Part-time Students: Many remedial education students attend part-time. At Westchester Community College, where this study is being conducted, over one-fourth (29.1%) of the Fall 1994 first-time, part-time students were taking one or more remedial education courses. To leave them out of the equation is to overlook a large segment of the under-prepared student body. It is recommended, therefore, two sub-cohorts be created each Fall semester—one for full-time students (twelve credit hours or more) and one for part-timers.

Track Successes Along the Way: Very few college administrators and faculty now subscribe to the thesis that the act of graduating is the only indicator of success. Many students profit from their college experience just by improving their reading, writing, and math skills or becoming more English language proficient. With this thought in mind, eight indicators have been identified to measure *student success* as they progress through the college system. They include the following number and percentage who:

1. Attempt at least one remedial course
2. Pass all remedial courses attempted
3. Attempt at least one *gatekeeper* course
4. Pass all *gatekeeper* courses attempted
5. Maintained a GPA of 2.00 or above
6. Graduate within eight semesters
7. Transfer (without graduating) to a four-year college
8. *Persist* into the ninth semester

A word about several of the indicators. A *gatekeeper course* is defined as an entry-level credit course that involves a mastery of a basic skill and must be passed in order to graduate. In the case of this study, the courses that were considered *gatekeeper* courses were English Composition & Literature I, College Algebra, and College Algebra & Trigonometry. A *gatekeeper* course shows progress both in the form of transition from a remedial course to a college credit course, and, upon successful completion, transition to more advanced courses.

The GPA indicator helps determine who left because of inadequate academic performance as opposed to some other reason. A *persister* is a student who is still enrolled in the ninth semester. Again, going out farther in the length of tracking time is essential for remedial education students. Those still enrolled in the eighth semester are not failures. They are simply succeeding slowly.

Remedial Education Success at Westchester Community College

Using the methodology described above, the following is a step by step account of measuring the success of remedial education students (students taking one or more remedial education courses) at Westchester Community College who began in Fall 1994.

Fall 1994 First-time, Full-time Cohort: There were 1,222 first-time, full-time students in the Fall 1994 cohort at Westchester Community College, as shown in Table 1. Over three-fifths of them (63.1%) attempted one or more remedial courses. Of these, two-thirds (66.9%) passed all the remedial courses attempted.*

Table 1 Fall 1994 First-Time, Full-Time Students*[1]

The second step in measuring *student success* requires separating the remedial education students from the non-remedial students, as shown in Tables 2 and 3. Well over four-fifths of the remedial students (83.0%) attempted a *gatekeeper* course. Of these, over two-thirds (69.7%) passed all the *gatekeeper* courses attempted. The non-remedial students had only a slightly higher percentage (86.3%) attempting one or more *gatekeeper* courses, but a substantially higher percentage (80.7%) passing all of the courses attempted.

In short, approximately the same percentage of remedial and non-remedial students attempted *gatekeeper* courses, but the percentage of remedial students who passed them was substantially lower (11%) than the non-remedial students (69.7% to 80.7%).

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* Mandatory testing for full-time students was initiated in 1995. Some students, however, have been able to take advanced courses because *computerized blocking* was not in place. The *blocking* process is scheduled to be operational by Fall 1999.

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[1] Tables referenced in this article may by obtained by contacting the author.

Table 2 Remedial Students

Table 3 Non-Remedial Students

The third step in measuring *student success* is the grade point average maintained by students. As shown in Tables 2 and 3, two-thirds (67.4%) of the non-remedial students maintained a GPA of 2.00 or greater compared to only half (50.2%) of the remedial education students. This is a difference of over seventeen percentage points. While students can enroll at WCC for as long as they wish with a GPA below 2.00, the regulations governing TAP and PELL grant awards and the *Pursuit and Progress* standards restrict the number of semesters a student can receive financial aid. A low GPA indicates not only an inability to pass courses, but a possible loss of financial aid. The combination of both may explain the large drop in enrollments after students attempt gatekeeper courses.

The fourth step is the graduation rate or *transfer-out* rate. Only 17.4% of the remedial students graduated in three years compared to 23.5% of the non-remedial students, as shown in Tables 2 and 3. In the case of transferring to a four-year college, the disparity is even greater. Only 5.7% of the remedial students transferred compared to 28.2% of the non-remedial students!

The fifth step, however, that of measuring *persistence,* reveals a fuller picture. A higher percentage of remedial students (18.7%) were still enrolled than non-remedial students (13.1%) at the end of the eighth semester. This stands to reason, of course, because the remedial students have the handicap of taking non-credit-bearing courses before they can take credit courses leading to a degree.

ESL Students: In addition to comparing the remedial students to the non-remedial students, ESL students were separated out to see if their *success* differed substantial from the other students.** As shown in Table 4, 86.1% of the ESL students passed all the ESL courses attempted after eight semesters. Over three-fourths of this group (77.8%) attempted remedial courses with slightly over four-fifths (82.1%) passing all the courses attempted. Based on these statistics, therefore, the success of the College in bringing ESL students up to college-level capability is rather high.

Moreover, approximately the same percentage of ESL students attempted a *gatekeeper* course (83.3%) as remedial students (83.0%), but a much higher percentage of ESL students passed (83.3%) all the gatekeeper courses attempted than remedial students (69.7%). Speculation as to why this is the case includes the possibility that many foreign students at WCC may initially lack English skills, but once this handicap is overcome, they are well equipped to handle the other courses.

** It should be noted that the size of this ESL full-time student cohort is small—36 students.

Continuing with the steps of *student success* for ESL students, over one-fifth (22.2%) had graduated in four years and 27.8% were still enrolled, a much higher percentage of *persisters* than for the remedial (18.7%) and non-remedial (13.1%) students. **In short, ESL students are taking longer to graduate, but they *are* graduating and at a rate (22.2%) above that of remedial education students (17.4%).** For a more complete picture, studies of ESL students might appropriately go out five years to completion.

Table 4 ESL Students

Fall 1994 Cohort Part-Time Students: In further measuring *student success*, substantial differences occurred between the part-time and full-time students. A much smaller percentage of the part-time students (29.1%) took a remedial course than the full-time students (63.1%), as shown in Table 5.

Table 5 Part-Time Students

Of the part-time students who did attempt remedial courses, a much lower percentage (53.7% compared to 66.9% of the full-time students) passed all the remedial courses attempted. Moreover, only 56.4% of the part-time students attempted a gatekeeper course, while over four-fifths (83.0%) of the full-time remedial students attempted one or more. Only two-fifths (39.5%) of the part-time remedial students passed all gatekeeper courses attempted, compared to over two-thirds (69.7%) of the full-time remedial students. Clearly, the *student success* of part-time remedial students in the first few semesters is substantially lower than that of the full-time remedial students.

When it comes to graduating only 3.7% of the part-time students had graduated in eight semesters, compared to 17.4% if the full-time students, although about the same percentage of part-time students (20.3%) as full-time students (18.7%) were persisting. Lastly, a smaller percentage of part-time students were able to maintain a GPA of 2.00 or better over eight semesters (43.6%) than full-time remedial students (50.2%).
In short, part-time students are a much smaller source of our remedial education student body (a little over one-third took remedial classes), and, when they do take such courses, they succeed at substantially lower rates.

Summary and Observations

Based on the data derived from using this methodology, several basic statements about the success of remedial education students at Westchester Community College can be made.

First, Westchester Community College has a higher percentage of its students taking one or more remedial education courses than the nationwide average. Forty-seven percent (47.6%) of Fall 1994 first-time students at the College were enrolled in a remedial course compared to the national average of only 41%. This places a greater burden on the WCC faculty to overcome the deficiencies in learning skills of their students than is true nationwide.

Second, a good percentage of the Fall 1994 full-time students taking one or more remedial education courses passed them. Two-thirds (66.9%) of the students passed all courses attempted. This says something quite positive about the success of these students and the faculty that help them to achieve it. As might be expected, however, a substantially higher percentage of non-remedial students passed gate keeper courses, maintained at least a 2:00 GPA, and graduated or transferred, than did remedial education students.

Third, a comparatively small percentage of the Fall 1994 part-time students took remedial courses, only 29.1% compared to 63.1% of the full-time students. Of those who did take remedial courses, a much lower percentage (53.7%) passed all courses attempted than did full-time students (66.9%). In short, part-time students comprise a relatively smaller percentage of the remedial education student body, and have a substantially lower success rate.

Fourth, Although the cohort of first-time, full-time credit ESL students is small (36), the figures indicate that, given additional time, these students are succeeding at a better rate than non-ESL full-time remedial students. Over four-fifths (82.1%) passed all the remedial courses taken and over four-fifths (83.3%) passed all the gatekeeper courses taken. Moreover, their graduation rate (22.2%) exceeds the remedial students' rate (17.4%). The fact that their persistence rate at the end of eight semesters (27.8%) is much higher than the remedial students (18.7%), indicates that ESL students, while they may be taking longer than remedial students to get a degree, are graduating in higher percentages.

Fifth, for all categories of remedial education students, a substantial drop occurs in the percentages that pass gatekeeper courses. Greater focus on answering why this drop occurs at this point may provide positive benefits in helping the faculty to know where to intervene in helping students to see their education to completion.

A Final Word about the Methodology. The methodology used in this paper to measure *student success* for remedial education students at Westchester Community College also provides the means to compare our students with other colleges in the SUNY system and nationwide. Moreover, at a more basic level of analysis, this methodology provides the means to compare the *success* of our students on a course by course or program by program (reading, writing or math) basis.

Additionally, the *indicators* used to measure *student success* semester by semester, to wit (1) remedial education courses passed, (2) gatekeeper courses passed, (3) grade point average above 2.00, (4) transfer rate, (5) graduation rate) provide the type of information needed to know where to intervene to make improvements. They also help to reinforce a notion recognized by virtually all community college faculty and administrators, that *student success,* occurs not just at the point of graduation, but throughout the time the students is attending college.

WHAT HAVE CONNECTICUT PUBLIC HIGH SCHOOL GRADUATES BEEN DOING AND HOW MANY OF THEM WILL THERE BE?

An Analysis of High School Graduates and Projection Data

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In the state of Connecticut, Department of Higher Education oversees the postsecondary education activities in the state. Department of Education oversees elementary and secondary education activities. Department of Education collects public high school enrollment data and also collects graduating class report in which each public high school reports the summer graduates' post graduation activities as of the following October.

Over the years, I have been wondering about the postsecondary education choices of the high school graduates and if there is a difference in pursuing higher education by race and ethnicity background. I contacted Department of Education and requested high school graduation class report data for the last 5-6 years.

In this report, I will address two questions – question 1: What has happened to Connecticut Public High School graduates over the last five years? How many were there and where did they go after they graduated from high school? Question 2: What will happen to the high school graduates in the future? How many more are we expecting each year? I will also take look the impact of the increasing public high school graduates for a small community college that enrolls as much as 25% of the graduating class from one area public high school.

What Has Happened To Connecticut Public High School Graduates?

I. Increasing Number of Graduates

According to the Connecticut Department of Education, in 1998 there were 26,187 graduates from public high schools and 1,698 from regional vocational-technical schools in Connecticut. This total, 27,885, is a 5.91% increase over 1994 (26,330).[1]

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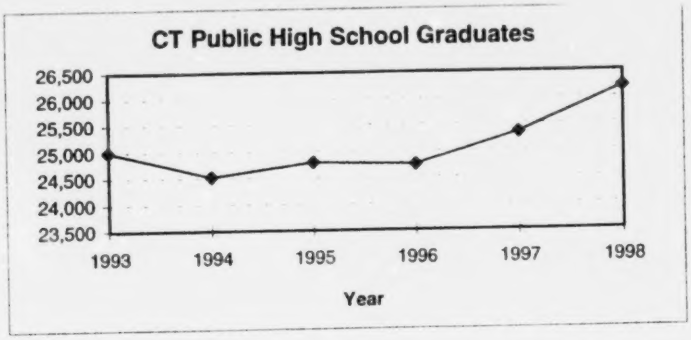
[1] As of 1991, State Department of Education stopped collection of nonpublic high school data. In a report done by the staff of State Department of Education in early 1997, it stated that there were an estimated 5,000 graduates from nonpublic high schools in the state in 1996. There were also 5,382 adults received General Educational Development (GED) or high school credit diplomas in the same year. While examining the profile of the high school graduates in Connecticut, the above GED data and data for nonpublic high schools were not included in this report.

Graph 1 shows the five years graduation numbers for Connecticut Public High School graduates. You will notice that the number of graduates declined from 1993 to 1994, and after two years of stability, rose in 1997 and 1998.



Graph 1: 1996 was expected to be the bottom of a long-term decline in the number of graduates.

The number of high school graduates increased, meaning that more freshmen would be looking for college and universities to attend. In Connecticut, more than 90% of Connecticut State University and Connecticut Community Technical Colleges students came from 169 Connecticut towns.

II. More Graduates Continuing Education

Over the past five years, more public high school graduates in Connecticut have been continuing their education upon graduation from high school. Table 1 shows that in 1998, 20,885 public high school graduates pursued post-secondary education. Of those graduates, 20,074 continued their education at 2-year or 4-year colleges and universities, and 781 graduates went to Vocational School, Preparatory School or other certified post graduate programs (For details, please see Appendix A.).

Table 1: More Graduates Continuing Education

Number Full-time in Education	1994	1995	1996	1997	1998
Attending 4 Year Colleges	14,248	14,675	14,872	15,275	16,140
Attending 2 Year Colleges	3,874	3,857	3,790	3,819	3,934
Total Attend 2 or 4 year Colleges	18,122	18,532	18,662	19,094	20,074
Annual Percentage Change	-1.01%	2.26%	0.70%	2.31%	5.13%
Attend Other Post-secondary Education	960	959	888	864	781
Total Attending Post-secondary Education	**19,082**	**19,491**	**19,550**	**19,958**	**20,855**

The number of public high school graduates entering a 2-year or 4-year college increased 11% between 1994 and 1998, and has been increasing for the past 4 years.

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In 1998, about 56% of public high school graduates went out of state to attend 4-year colleges. There is a slight increase trend in the percent of public high school graduates chose to stay in Connecticut to continue their education. For those who stayed in Connecticut, nearly 80% of them went to the public 4-year colleges.

III. Fewer Graduates Entering The Work Force Directly

The number of public high school graduates who directly entered the work force has varied for the last 5 - 6 years. In general, the proportion of public high school graduates who directly entered the work force has decreased from 18.6% in 1993 to 16.9% last fall.

Table 2: Number In Work Force

	1993	1994	1995	1996	1997	1998
In Military Services	781	642	582	690	729	661
Employed	3,417	3,342	3,263	3,221	3,234	3,275
Unemployed	444	386	288	264	297	479
Total Number Entering Work Force	4,642	4,370	4,133	4,175	4,260	4,415
Total Number HS Graduates	24,998	24,523	24,781	24,743	25,337	26,187
Percent Entering Work Force	18.6%	17.8%	16.7%	16.9%	16.8%	16.9%

IV. Education and Labor Force Entry Patterns Differ by Race

As Table 3 shows, in 1998, 87% of the Asian American graduates continued their education after graduating from public high school. This is the group with the highest percentage continuing their education. The second highest was White, non-Hispanic (81.7%), followed by Black, non-Hispanic (71.9%), Hispanic (66.9%) and American Indian (63.6%) graduates.

Table 3: 1998, Post Education Activity Differs by Race

Year 1998	# of Graduates	% Cont. Ed	% WK Force	% Other
American Indian	55	63.6%	32.7%	3.6%
Asian American	785	87.0%	11.6%	1.4%
Black non-Hispanic	2,836	71.9%	21.5%	6.6%
White non-Hispanic	20,534	81.7%	15.4%	2.9%
Hispanic	1,977	66.9%	27.1%	6.0%
Total All	**26,187**	**79.6%**	**16.9%**	**3.5%**

1998 data showed that Asian American graduates are most likely to continue their education.

Conversely, Asian American graduates was the group least likely to enter the work force (11.6%) compared to American Indians (32.7%), Hispanics (27.1%), Blacks (21.5%) and Whites (15.4%).

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Data from that past 5 years showed the same patterns in post-graduation education and work force activities as those in 1998. Thus, over the last five years, the number of high school graduates entering postsecondary education has been increasing and the number of the graduates entering the work force directly after graduation has been decreasing. This is especially true for Black, non-Hispanic graduates and Hispanic graduates.

A recent study done by Anthony P. Carnevale, ETS, 1998 found that of Hispanic students at postsecondary institutions, only 36% attended selective colleges, compared with the more than 50% of White and Asian American students who are enrolled at such institutions. Two-thirds of Hispanic students go to community colleges and non-selective institutions after high school.

In CT, data from a high school graduate follow up survey showed that Hispanic people are less likely to enroll in competitive colleges and universities compared to White or Asian Americans. Of those Hispanic graduates who choose to attend a 2-year or 4-year college, they are more likely to choose to attend in-state two year public colleges (37.98%) compared to Asian American graduates, 11.57% and White, non-Hispanic graduates, 13.52% and Black, non-Hispanic graduates, 24.96%. (Table 4)

Table 4: Attending 2 Or 4-Year Colleges By Race/Ethnicity

Fall 1998 ***Number Full-time in Education***	American Indian	Asian American	Black non-Hispanic	White non-Hispanic	Hispanic	Race/Ethni. Total
Public 4yr College in CT	5	232	485	4,468	334	5,524
Public 4yr College Outside CT	4	74	208	2,256	99	2,641
Nonpublic 4yr College in CT	2	64	185	1,172	117	1,540
Nonpublic 4yr College Outside CT	9	212	434	5,653	127	6,435
Public 2yr College in CT	9	78	477	2,193	469	3,226
Public 2yr College Outside CT	2	5	52	148	24	231
Nonpublic 2yr College in CT	1	3	39	153	46	242
Nonpublic 2yr College Outside CT	1	6	31	178	19	235
Total Attending 2 or 4 year Education	33	674	1,911	16,221	1,235	20,074
Total Graduates	55	785	2,836	20,534	1,977	26,188
Percent Full-time in Education						
Public 4yr College in CT	15.15%	34.42%	25.38%	27.54%	27.04%	27.52%
Public 4yr College Outside CT	12.12%	10.98%	10.88%	13.91%	8.02%	13.16%
Nonpublic 4yr College in CT	6.06%	9.50%	9.68%	7.23%	9.47%	7.67%
Nonpublic 4yr College Outside CT	27.27%	31.45%	22.71%	34.85%	10.28%	32.06%
Public 2yr College in CT	27.27%	11.57%	24.96%	13.52%	37.98%	16.07%
Public 2yr College Outside CT	6.06%	0.74%	2.72%	0.91%	1.94%	1.15%
Nonpublic 2yr College in CT	3.03%	0.45%	2.04%	0.94%	3.72%	1.21%
Nonpublic 2yr College Outside CT	3.03%	0.89%	1.62%	1.10%	1.54%	1.17%
Total Attending 2 or 4 year Education	60.00%	85.86%	67.38%	79.00%	62.47%	76.65%

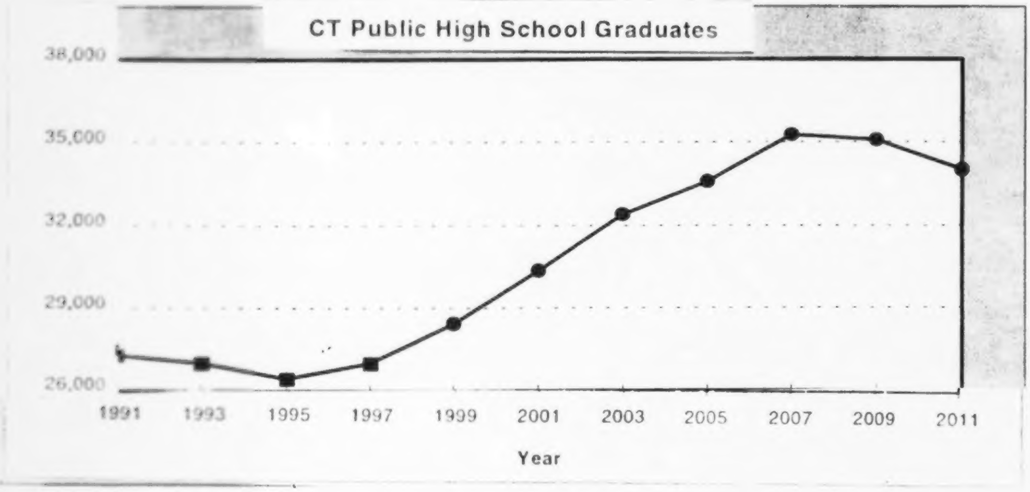
What Will Happen In The Future?

I. Enrollment and Projection of Public High School

The latest edition, 1998 Digest of Education Statistics reported that nationwide, enrollment in public elementary and secondary schools rose 19% between 1985 and 1998. Secondary enrollments declined 8% from 1985 to 1990 but then rose by 17% from 1990 to 1998, for a net increase of 7%. NCES also forecasted that public secondary school enrollment is expected to have a substantial increase of 11% between 1998 and 2008. In Connecticut, between 1987 and 1996 enrollment in public elementary and secondary schools rose 13%. In the last three years, it rose an average of 2.6% each year.

Data collected by the Connecticut State Department of Education had also shown, 12th grade enrollment alone rose 5% between 1990 and 1998. It was projected to continue to grow each year and reach a peak by 2007, making it a 24% increase for the next decade.

Graph 2 displays the graduates and projected graduates for Connecticut from 1991 to the year 2011. As you can see, the projected public high school graduates showed a clear trend of increase over the next 10 years.



Graph 2: 1991 to 1998 are actual numbers. From 1999 are projected numbers.
The projected number showed that there is an increasing trend of high school graduates.
Source: Connecticut Department of Education

The graduate projection data provided by Connecticut Department of Education showed that the number of high school graduates in Connecticut are expected to rise over the next decade and reach 35,710 by the year 2008, a 37% increase over 1997.

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II. Projection of Public High School by Race/Ethnicity

Hispanics are the nation fastest growing minority. In Connecticut, projection detail data provided by Western Interstate Commission for Higher Education (WICHE) and the College Board showed that by the year 2005, Hispanic graduates are projected to more than double in number reaching 3,725. Black graduates are projected to increase 62.4%, from 2,811 to 4,564. Asian Americans are projected increase 43.6%. Whites are projected grow the slowest, with a 25.3% increase by 2005. American Indians have smaller number of graduates each year, the numbers are projected to reach a peak by year 2005 with 117 graduates. The detailed data can be found in Appendix B.

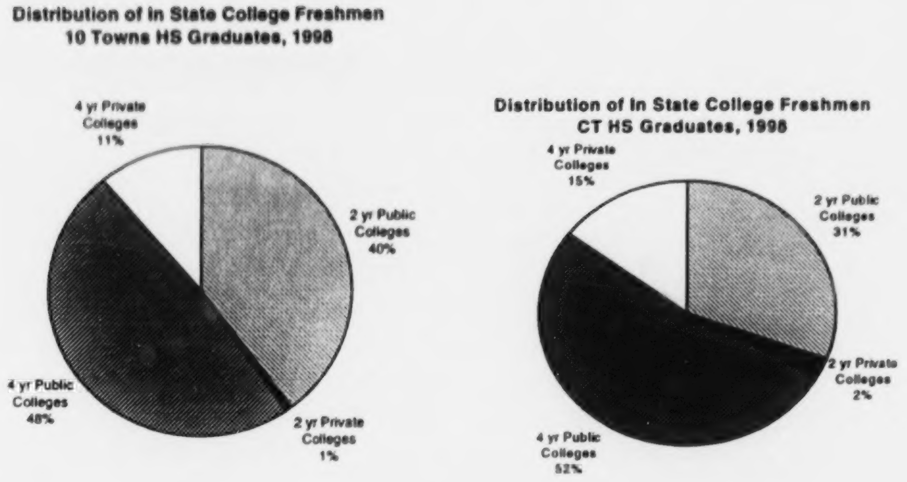
Table 5: Projected Public High School Graduates by Race/Ethnicity
Source: Western Interstate Commission for Higher Education

Year	Race/Ethnicity Total**	American Indian	Asian American	Black non-Hispanic	White non-Hispanic	Hispanic
1998	29,269	85	816	3,407	22,421	2,540
1999	30,036	72	972	3,541	22,697	2,754
2000	30,328	61	938	3,651	22,967	2,711
2001	31,534	76	971	3,946	23,584	2,957
2002	32,807	67	1,049	4,051	24,415	3,225
2003	33,378	100	1,066	4,292	24,571	3,349
2004	33,707	89	1,045	4,305	24,626	3,642
2005	34,402	117	1,146	4,564	24,850	3,725

* The sum of projected graduates by race/ethnicity will not equal the total projected graduates since the projected graduates for each racial/ethnic group are generated separately.

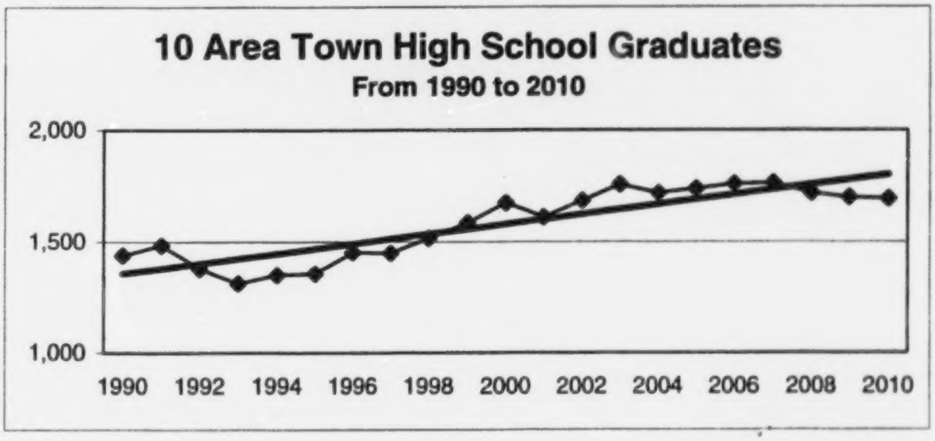
III. Enrollment and Projection for 10 Area Towns

More than 90% of Asnuntuck Community College students hold a home address with in 10 area towns. In 1999, two high schools in town the of Enfield, where the college is located, 25% of Enrico Fermi High School and 22% of Enfield High School graduating class chose to attend Asnuntuck Community College upon graduation.



Graph 3: Distribution of In-State College Freshmen

Graph 3, Compared to the entire state where 31% of the public high school graduates choose to attend 2 year public community colleges, 40% of the area graduates select 2 year public community colleges. In Fall 1999, freshmen made up 1/3 of the total Asnuntuck headcount enrollment. Of those freshmen, 40% of them were age 19 and under.



Graph 4 shows the trend of 10 area towns high school graduates from 1990 to 2010.

While it is good news for us that area high school graduates chose our school for continuing post-secondary education, that near 95% of our students are White and there is

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a very small Hispanic population in these ten towns, any decrease in population will impact our freshmen enrollment.

Census population projections showed an overall decrease in population for Connecticut and 10 area towns in 2002, the proportion of Hispanic population was projected to increase from 6.19% in 1990 to 6.71% in 2002 in Connecticut. In the 10 area towns Asnuntuck serves, the growth of Hispanic population is relatively slower compared to the state's general population. 1990 census showed this 10 town area had 2,878 Hispanics, 1.91% of the total population, by 2002, it was projected to increase to 2,996, make up a 2.03% of the total population.

To project the possible entering student class size for Asnuntuck, I took a look at the last 3 years graduation rates and entering 2 year public community college rates for the high schools in the ten towns that Asnuntuck serves. Table 6 is based on two assumptions. First, assuming that the graduation rates will not be changing too much. Second, assuming that the likelihood of high school graduates selecting Asnuntuck to continue their education will stay the same. If the all the assumptions are true, then it yields the 3 year average 'market share' (percent of 10 area town high school graduates attending 2 year public college) rate of 14.13%. The percentage was applied to the projected 'pool' of public high school enrollment, shown a very rough estimate of number of area high school graduates likely coming to Asnuntuck for college.

While public 2-year colleges in other parts of the state may experience fast growing numbers of freshmen in the next 10 years, generally the number of public high school graduates whom may choose to come to Asnuntuck, would average 240 each year for the next 12 years. Thus, compared to fall 1999, we are expecting a bigger new entering student class next fall.

Table 6: Possible New Entering Class Size for Asnuntuck

Academic Year	10 Towns Enrollment	Attend 2yr Comm College	Percent Annual Change
1998-99	1515	214	
1999-00	1585	224	4.66%
2000-01	1672	236	5.49%
2001-02	1609	227	-3.77%
2002-03	1681	238	4.48%
2003-04	1757	248	4.52%
2004-05	1719	243	-2.17%
2005-06	1736	245	1.00%
2006-07	1760	249	1.40%
2007-08	1760	249	0.00%
2008-09	1718	243	-2.43%
2009-10	1699	240	-1.11%
2010-11	1693	239	-0.32%

In summary, while the high school graduates are increasing nationwide and also in Connecticut, one can not assume that the increase will affect your campus in the same way as the nation and the state. It is very important to know who are your freshmen, where your students come from (your feeder schools) and the demography of your region to really understand the potential impacts to your own campus.

Appendix A

Connecticut Public High School Graduate Class Report

Source: Connecticut Department of Education

Number Full-time in Education	**1994**	**1995**	**1996**	**1997**	**1998**
Public 4yr College in CT	4,414	4,534	4,737	5,186	5,524
Public 4yr College Outside CT	2,404	2,556	2,529	2,549	2,641
Nonpublic 4yr College in CT	1,467	1,375	1,534	1,478	1,540
Nonpublic 4yr College Outside CT	5,963	6,210	6,072	6,062	6,435
Public 2yr College in CT	3,089	3,069	3,039	3,123	3,226
Public 2yr College Outside CT	215	237	199	227	231
Nonpublic 2yr College in CT	237	231	282	235	242
Nonpublic 2yr College Outside CT	333	320	270	234	235
Total Attend 2 or 4 year Colleges	**18,122**	**18,532**	**18,662**	**19,094**	**20,074**
Post Graduate or Preparatory Sch	109	135	125	106	122
Vocational Sch or College(cert)	694	652	604	603	539
Other Primarily Ed Activities	157	172	159	155	120
Total Attend Post Secondary Education	**19,082**	**19,491**	**19,550**	**19,958**	**20,855**
Number In Work Force					
In Military Services	642	582	690	729	661
Employed	3,342	3,263	3,221	3,234	3,275
Unemployed	386	288	264	297	479
Number With Other Status					
Full-time Homemaking	112	113	82	68	71
Other Status not listed Above	158	129	130	112	164
Deceased or Incapacitated	9	7	6	2	9
Status Unknown	792	908	800	937	673
Total All Public High School Graduates	**24,523**	**24,781**	**24,743**	**25,337**	**26,187**

Note: In Connecticut, Department of Higher Education oversees the postsecondary education activities. Department of Education was the one who collected public high school enrollment data. This department also collects graduating class report in which each public high school reports the summer graduates' post graduation activities as of that October.

Appendix B

Projection of Connecticut High School Graduates

Source: Western Interstate Commission for Higher Education. Knocking at the College Door Regional Compendium of Supplementary Tables: Northeast 1998

Year	Public Total	Public By Race/Ethnicity						Non-Public	Public & Non-public Total
		Race/Eth. Total	Ameri. Indian	Asian Ameri.	Black, non-Hispanic	White, non-Hispanic	Hispanic		
1998	29550	29269	85	816	3407	22421	2540	5439	34989
1999	30276	30036	72	972	3541	22697	2754	5603	35879
2000	30569	30328	61	938	3651	22967	2711	5793	36362
2001	31831	31534	76	971	3946	23584	2957	5939	37770
2002	33126	32807	67	1049	4051	24415	3225	6100	39226
2003	33709	33378	100	1066	4292	24571	3349	6151	39860
2004	34084	33707	89	1045	4305	24626	3642	6324	40408
2005	34752	34402	117	1146	4564	24850	3725	6607	41359
2006	35387	35008	155	1168	4867	24743	4075	6751	42138
2007	36392	35508	142	1272	4840	24848	4406	6788	43180
2008	35262	34477	170	1289	4891	24014	4113	6577	41839
2009	34541	33799	214	1253	4732	23402	4198	6443	40984
2010	33907	33150	182	1289	4397	23119	4163	6325	40232
2011	33149	32516	270	1412	4110	22567	4157	6183	39332

* The sum of projected graduates by race/ethnicity will not equal the total projected graduates since the projected graduates for each racial/ethnic group are generated separately.

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WHAT PREVENTS THE DEVELOPMENT OF DISTANCE LEARNING IN THE HIGHER EDUCATION MARKET?

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Introduction

In 1995, the National Center for Education Statistics (NCES) conducted its first national survey on distance education courses offered by higher education institutions. One of the most intriguing findings was that in contrast to the private sector, a much higher percentage of public institutions offered distance learning courses. Fifty-eight percent of public 2-year and 62 percent of public 4-year institutions offered distance learning courses while only 2 percent of private 2-year and 12 percent of private 4-year institutions offered such courses (NCES, 1997). Why does such a large discrepancy exist in the development of distance learning across public and private institutions? An attempt to answer this simple question is indeed driving this project forward. This phenomenon can be simply attributed to a long tradition of the civic service mission of public institutions, which is to provide educational services to diverse audiences at geographically dispersed sites. The project, however, goes beyond the descriptive explanation and tries to reveal underlying causes that have been driving or hindering the development of distance learning.

Purpose of Research

In collaboration with the National Center for Education Statistics, this project conducts large multivariate analyses of the 1995 and 1998 NCES Distance Education Survey data in order to reveal underlying primary factors that have been driving or hindering the development of technology-based distance education in the postsecondary higher education market. Since the 1998 longitudinal survey data is not for public use yet, the first phase of the project deals with the 1995 survey data only. The primary objectives of this session are, therefore, to share the up-to-date progress of the first phase of the project and to discuss the benefits that the distance learning community would receive.

Literature Review: The Current State of Distance Learning Research

Comparative effectiveness of distance and traditional classroom learning has been a long-time focus of distance education research since the early 1920s (Russell, 1998). Little research effort has been made so far, however, either in gathering comprehensive statistical information on technology-based distance learning or in studying its effects on the higher education market structure or the administration of higher education.

Distance learning is defined in this study as "any electronically mediated formal learning program wherein the students and faculty are separated by distance, time, or both" (Lipsky, 1998). This definition is superior to others (e.g., Connick, 1998, p. 3) since it eliminates from its definition the traditional correspondence method and informal/incidental learning modes. Furthermore, it successfully states both space and time separation of students from faculty as essential components of distance learning. Often distance learning connotes only geographical separation between the two parties, in spite of the increasing importance of its asynchronous learning feature. Distance learning takes place as a result of distance education (hereinafter DE).

Statistics of DE users are mostly compiled at the institutional level, and the reports written based on such statistics are largely descriptive in nature (i.e., Field, 1998; Guidos, 1998). Thus, rigorous DE research is of paramount importance at the national or regional level given its rapid expansion in both non-profit and profit sectors. To the authors' knowledge, two major surveys have been completed in recent years, and one is currently in progress. In fall 1995, the National Center for Education Statistics (NCES) conducted a survey on "Distance Education Courses Offered by Higher Education Institutions" using the Postsecondary Education Quick Information System (PEQIS) (NCES, 1998) and a follow-up panel survey was conducted in 1998. The analysis of the 1988 study is in progress. In spring 1997, the Western Cooperative for Educational Telecommunications (WCET) conducted a mail survey on "Putting Principles into Practice: Promoting Effective Support Services for Students in Distance Learning Programs" to identify current service practices for DE students (WCET, 1998).

Based on the survey results, NCES estimated that in the academic year 1994-95, 25,730 DE courses were offered by higher education institutions, and 758,640 out of about 14.3 million students enrolled in these courses. The NCES study also described that the major factors preventing institutions from starting or expanding DE courses were related to cost and technology concerns, such as program development cost (43%), limited technological infrastructure (31%), and equipment failures and costs of equipment maintenance (23%). Unfortunately, the study failed to link these factors to answering why the majority of private 4-year institutions refused to offer distance learning courses.

The survey conducted by the Western Cooperative for Educational Telecommunications is a first attempt to reveal institutions' current service practices for DE students. The survey found that 80% of the 407 institutions which responded to their mail survey offered DE courses, and nearly half of them have offered DE courses for 11 years or more. However, in terms of student services, most institutions were inadequate to meet distance learners' needs. Particularly, such areas as social support network services, general and career counseling, and library services needed much improvement, while on-line registration, course-specific advising, and degree audits were relatively well adapted (WCET, 1998).

As reported above, these surveys have made significant contributions to our understanding of the recent rapid development of DE course offerings and institutions' service practices for DE students. The statistical analysis applied in the studies was, however, one-way cross tabulation, and findings reported are largely descriptive in nature. In other words, these studies have not offered adequate research power to answer the "why" questions. Can they answer, for instance, why there is a large discrepancy in the development of distance learning between public and private institutions? In order to answer this seemingly simple question, we do indeed need to conduct more complex, multivariate analyses to uncover underlying causal factors that have been driving the recent development of distance learning. The proposed project will be a first attempt to do such work.

Data and Research Questions

In the first phase of the project, the 1995 NCES Distance Education Survey data were analyzed. In the 1995 survey, 1,274 institutions were selected as a sample using the stratified random sampling method. These institutions represent the universe of approximately 3,460 higher education institutions in the U.S. The data were collected by mail through the Postsecondary Education Quick Information System (PEQIS), and the final response rate was 94 percent.

The questionnaire asked, "Did your institution offer any distance education courses in 1994-95 (12-month academic year), or plan to offer any such courses in the next 3 years?" Three options were given: (1) Yes, offered courses in 1994-95; (2) Did not offer in 1994-95, but plan to offer in the next three years; (3) No, did not offer in 1994-95 and do not plan to offer in next 3 years. According to this answer and the type of the institution, we have formed six groups, which are: (1) Public Institution Distance Education (hereinafter DE) Provider; (2) Public Institution DE Starter; (3) Public Institution DE Non-Provider; (4) Private Institution DE Provider; (5) Private Institution DE Starter; and (6) Private Institution DE Non-Provider. Only four-year educational institutions were included in the analysis in order to limit the scope of the study. The final unweighted number of the institutions studied were 349 public 4-year institutions and 406 private 4-year institutions. Weighted national estimates were 610 public 4-year institutions and 1,540 private 4-year institutions.

The questionnaire also asked to what extent, if any, the following fifteen items were keeping the institutions from starting or expanding distance education offerings. Those items include: 1) lack of fit with institution's mission; 2) lack of perceived need; 3) lack of administrative support; 4) program development costs; 5) equipment failure/ maintenance costs; 6) limited tech infrastructure; 7) concerns about faculty workload; 8) lack of faculty interest; 9) lack of faculty incentives; 10) legal concerns; 11) concerns about course quality; 12) lack of access to instructional support; 13) inter-institutional problems (e.g., allocations of aid, course credit); 14) restrictive federal, state or local policies; and 15) inability to obtain state authorization. The response categories were "not at all," "minor extent," "moderate extent," and "major extent." Besides these fifteen questions, five institutional characteristic variables were included in the analysis. Those are two dichotomous variables to indicate its school size (less than 3,000; 3,000-9,999 and 10,000 +) and three dichotomous variables to describe regional location (Northeast; Southeast, Central and West). The study attempts to reveal underlying causal dimensions, which separate distance education practice at public and private 4-year institutions.

Methodology

Factor analysis is run to reveal underlying causal dimensions, using twenty variables described above. Factor analysis is the statistical method to reduce the large number of measures/question items to the smaller number of underlying uncorrelated factors. In other words, this statistical method mathematically describes which question items belong together and which question items measure the same underlying abstract concepts. Factor analysis is often being used for the purpose of exploring new research questions without having a much solid theoretical framework. Factor analysis is an explanatory multivariate research technique, rather than a hypothesis testing technique. Mathematical expression of factor analysis can be found elsewhere (e.g., Johnson and Wichern, 1988).

Descriptive Results

Out of the total number of four-year institutions (public and private combined), 26.2% were DE providers, 26% were DE starters, and 47.8% were non-providers. Sixty-two percent of public 4-year institutions (N=610) are DE providers, 23% starters, and 15% non-providers. In contrast, 12% of private 4-year institutions (N=1,540) are DE providers, 27% starters, and 61% non-providers (See the NCES Report, 1997).

A similar symmetric pattern has appeared, when the distance education offering types are cross-tabulated by institutional size. Percentage breakdowns of DE providers, starters, and non-providers are 16%, 27% and 56% for institutions with enrollment less than 3,000; 61%, 24% and 15% for institutional size between 3,000 and 9,999; 76%, 14% and 10% for institutions with enrollment over 10,000 respectively (NCES, 1997). Clearly, for smaller institutions with enrollment size less than 3,000, distance learning is not a strategic choice. The distance education offering types are also tabulated by geographic region. Percentage breakdowns of DE providers, starters, and non-providers are 20%, 17% and 56% for Northeast; 31%, 28% and 41% for Southeast; 39%, 24% and 37% for Central; and 40%, 23% and 37% for West respectively (NCES, 1997). It confirms our common observation that the development of distance education has been spread from West to East.

The descriptive statistics of the reasons why institutions are kept from starting or expanding distance education offerings, indicate several interesting patterns. The first pattern is related to whether DE course offering matches the institution's mission and the existence of perceived need, and whether DE course offering justifies administrative/instructional support and course equity. Forty-five percent of the public and 44% of the private institutions that did not plan to offer DE courses, cited lack of fit with institution's mission as a major hindrance, whereas this reason was insignificant for most of the DE providers and starters.

The second pattern deals with the resource issues including program development cost, equipment maintenance cost, and technological infrastructure. Concerns about cost are viewed as the most serious hindrance for DE course development by most of the institutions surveyed. Interestingly, private non-providers are the least concerned about the cost issues. Probably, to these institutions, the institution mission issue needs to be resolved first before dealing with the cost.

The third pattern is centered around faculty issues, including faculty workload, interest level in DE, and incentives. The majority of the institutions view faculty issues as significant factors that prevent the development/expansion of DE education. The public institutions that have been offering DE courses most strongly expressed that this is the case. In order to advance distance education, faculty issues seem to be one of the most challenging issues the institutions need to deal with, as indicated by other studies (Clark, 1993; Walcott, 1997).

The last pattern that needs to be mentioned is associated with regulatory concerns which encompass restrictive public policies, inability to obtain state authorization and other legal issues. Generally, these regulatory issues are not viewed as significant as other issues described above. While these descriptive statistics provide us with some useful information, we need to run a multivariate analysis to clarify the interrelationships among these variables and to reveal the underlying factor structure.

Factor Analysis Results

As presented in Table 1[1], factor analysis using the principal component method has revealed the major factors that prevent the institutions from starting or expanding distance education offerings. The first two factors are particularly noteworthy due to the magnitude of their eigenvalues greater than 2.0. The first factor had high factor loadings related to faculty variables, that is, concern about faculty workload, lack of faculty incentives and interests, and concerns about intellectual property/copy rights, and course equity. It also had high loadings associated with various resource availability variables (i.e., program development cost, equipment maintenance cost, inter-institutional resource issues, lack of instructional as well as administration support, and limited infrastructure). We call this factor, therefore, the "faculty/resource support dimension."

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[1] Table 1 referenced in this article may be obtained by contacting the authors.

The second factor, which we call the "mission congruence dimension," had high factor loadings on lack of fit with institution's mission and lack of perceived need. These two dimensions together accounted for about 35% of the variance. A varimax rotation of the two factors was performed as presented in Table 2. Average factor scores of these two factors were then calculated for each of the six DE practice groups. Plotting average factor scores graphically illustrates where in the four quadrants each of the six groups belongs.

The plot as presented in Figure 1 has revealed intriguing insights on why institutions are reluctant to start or expand distance education programs. The private non-provider group resides in the lower, right quadrant. This group perceives that they have some faculty/resource support. However, lack of fit with the institution's mission seems a major stumbling block for not offering distance education programs. The public non-providers are, in contrast, placed in the lower, left quadrant. These institutions seem inhibited from both lack of faculty/resource support and lack of mission congruence.

The DE providers from the public sector, which reside in the upper, left quadrant, perceive that their institutions' missions highly match with DE course offering, but they are kept from expanding DE programs due to the lack of faculty/resource support. The private institutions that would like to offer DE programs within three years, also reside in this quadrant. These private DE starters express the need of more faculty/resource support while they have a moderate level of mission fit.

The private DE providers and the public DE starters position themselves in the upper, right quadrant, which is the most desirable scenario. The DE providers from the private sector seem to enjoy sufficient faculty/resource support, and have a moderate level of mission congruence. Public institutions that expressed their intentions to offer DE programs within three years seem in the best position. They perceived themselves as having a high level of faculty/resource support as well as a moderate level of mission support.

Summary and discussion

It is of cardinal importance for institutional researchers and DE administrators to understand the extent to which certain kinds of factors may be preventing institutions from fully developing distance education programs. The present study is an attempt to answer this question by conducting multivariate analysis on the 1995 National Distance Education Survey data collected by the National Center for Education Statistics.

The study has revealed two primary factors, the "Faculty/Resource Support" factor and the "Mission Congruence" factor, which have successfully explained differences in distance education practice at public and private four-year institutions. Clearly, the majority of the private institutions are reluctant to offer DE programs due to their perceptions that offering DE courses does not match their educational missions. However, the majority of public institutions are concerned about faculty workload, interest and incentives, as well as lack of adequate resource support.

The present study is the first phase of the large project, which analyzes the panel survey data of the 1995 and 1998 NCES Distance Education Survey data in order to reveal underlying primary factors that have been driving or hindering the development of technology-based distance education in the postsecondary higher education market. Such knowledge may be very useful in understanding how distance education is developing in the higher education market, and informing effective strategies to assist different types of institutions while pursuing distance education as an innovative instructional option in the future.

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FACTORS ASSOCIATED WITH RETENTION IN A DISTANCE-BASED LIBERAL ARTS PROGRAM

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Student retention has been a troubling issue for administrators and faculty at institutions of higher education especially for non-traditional students. A recent study of this issue published by the National Center for Education Statistics (Horn & Carroll, 1996) indicated that 31% of non-traditional students in baccalaureate programs attain a degree within 5 years. This figure is significantly lower than the 54% this same report cites for degree attainment among traditional students. There is a significant literature on the topic of student retention. Tinto's (1975, 1987, 1993) influential work on retention is often cited, but others have developed models and researched the topic as well (cf. Adelman, 1999; Astin, 1975, 1993; Horn, 1998; Pascarella & Terenzini, 1991).

Regents College, America's First Virtual University, is a non-traditional academic institution founded in 1971 to serve the needs of adult learners. The college is virtual in its approach to learning, recognizing that what a person knows is more important than where or how that knowledge was acquired. The mission of the College is to help remove some of the barriers that exist for working adults in their quest for higher education, while maintaining rigorous standards of academic excellence. The College serves a student body of approximately 17,000 students and develops examinations taken for college credit by over 40,000 students annually. Over 1000 colleges and universities accept Regents College examinations for credit towards their degrees.

The typical enrolled Regents College undergraduate is a 41 year-old adult learner who is employed full-time and has competing family and work obligations. Approximately one-quarter of the Colleges' student body is from historically underrepresented groups in higher education. Regents College students move frequently, travel frequently, have changed their academic focus since their initial studies and are motivated to complete their degrees either to improve their employment situation or for personal satisfaction and enrichment. These motivations (career enhancement and personal enrichment) have been documented as the main reasons why adults seek participation in higher education (Cross, 1981; Kim, Collins, Stowe, & Chandler, 1995; Maehl, 1999; Nesler & Hanner, 1998).

The external degree programs are assessment based; the College offers no traditional classroom instruction at the undergraduate level. Regents College uses both direct and indirect assessment methods for evaluating students' knowledge and awarding credit. Direct assessments consist of Regents College standardized written and performance examinations. The college makes use of other types of assessments as well, including portfolios and special assessments. Indirect assessments of students learning, and the associated transfer of credits not obtained directly through the college's assessment, are dependent on explicit quality assurance frameworks. These frameworks include regional accreditation, American Council on Education (ACE) programs, and other special programs that have been evaluated by Regents College faculty. Credits acquired by students at regionally accredited institutions are usually accepted for transfer by Regents College and will be applied towards the student's degree requirements as is appropriate. ACE evaluates military education and training for credit, as well as training and education offered by business and industry, and other credit-by-examination programs. Regents College accepts ACE's credit recommendations in most instances. The credits students acquire or transfer to the college are evaluated against specific degree requirements and general education and degree specific outcome expectations, outlined in the Regents College Outcomes Assessment Framework (Peinovich & Nesler, 1999) as well as the college's catalogs.

The current analyses were conducted to determine empirically what factors are associated with student retention in the Regents College Bachelors Liberal Arts (BLA) program using information from the student database exclusively. Information about these factors could be used to identify profiles of students who are at-risk for withdrawal. The profiles could also provide information useful in the development of interventions for specific student types and could potentially be used for the development of a theoretical model of distance student retention.

Method

An extensive evaluation was conducted using computerized records of the entire population of students who enrolled in the BLA program over a ten year period (*N* = 30,287). The enrollment cohorts covered the time period of July 1988 through June 1998 to examine a wide range of demographic, academic, financial, and administrative variables that could potentially be related to retention.

Tracking a cohort through the Regents College system is a slightly different process than at other institutions because the college does not operate on a traditional academic calendar. Students can enroll in the college at any time and can graduate whenever they have completed their program of study[1]. The college does not use a system of classifying students by class year – instead students are given updated information about their academic standing each time they acquire additional college credits towards their degrees (generally by completing traditional courses at accredited campus-based programs, taking college-level proficiency examinations, or by completing distance learning courses or courses offered through the world wide web by regionally accredited colleges and universities).

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[1] Graduation actually occurs on a monthly basis, providing students with 12 times during the year to graduate. This graduation policy is in effect so that students can have an opportunity to pursue career and other opportunities without having to wait for a December or May conferral date.

Students are clustered by the fiscal year in which they enroll to create a cohort. If a student does not graduate within one calendar year from the time they enrolled, they are asked to pay a continuation fee to maintain their enrollment. Individuals who either graduate or pay a continuation fee on their anniversary date are considered to have been retained. Students who withdraw either by requesting a refund or by not paying their continuation fee are considered to have withdrawn. The vast majority of students who withdraw from the college do so by non-payment of their continuation fee – a type of passive withdrawal.

Table 1 indicates that student retention rates have increased slightly over time but seem to have remained steady over the past few years. Aggregating years 1988-89 through 1996-97 indicates that 16,783 of the students who enrolled in the Regents College Bachelors Liberal Arts program had graduated by 1998 and another 1,891 were still enrolled, for an aggregate retention rate of 67.9%. Retention has been slowly increasing over time, from a low of 61.6% retained in fiscal year 1988-89 to high of 88.5% retained in fiscal year 1997-98 (the 1997-98 figure is high due to the high percentage of students who were still enrolled at the time the data were extracted from the student database). Aggregating years 1988-89 through 1996-97 indicates that 61% of the students who enrolled in the Regents College Bachelors Liberal Arts program had graduated by 1998 and another 6.9% were still enrolled, for an aggregate retention rate of 67.9%. These figures compare favorably against those reported for non-traditional students pursuing baccalaureate degrees.

Table 1.[2]
Enrollment Status of Regents College Liberal Arts Students by Fiscal Year they Enrolled.

Table 2 reports retention rates by previous educational attainment, which was significantly associated with retention. Adult students already holding degrees are sometimes interested in receiving a degree in a different field in order to advance in their careers or change their career paths. For students who enrolled between 1988-89 and 1996-97, educational background was significantly associated with retention. Students with doctoral degrees had the highest retention of any group (74.2%), and students with foreign degrees had the lowest retention rate (50.6%).

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[2] Table 1 referenced in this article may be obtained by contacting the author.

Table 2.
Retention Percentages for Students who Enrolled From 1988-89 Through 1996-97 Based on Educational Background.

Education: Level:	High School Graduate	Certificate or Diploma	Associates Degree	Bachelors Degree	Doctoral Degree	Foreign Degree
% Graduated	61.5	45.2	62.9	68.8	72.2	41.0
% Retained	68.7	57.0	69.9	70.7	74.2	50.6
Total N	**6208**	**1,195**	**8,226**	**1,146**	**435**	**136**

Note: Only very few students (less than 1% of the total sample) reported having either less than 4 years of high school or a masters degree. Thus, these groupings are not included in the table.

Table 3 reports retention rates by racial/ethnic categories. As can be seen in the table, race was significantly associated with retention for students who enrolled between 1988-89 and 1996-97. Caucasian students comprised the largest group of students (79.9%), and had the highest retention rate (69.8%). Students from other racial/ethnic groups had lower retention rates, ranging from 59.2% for Asian/Pacific Islanders to 63.4% for Native Americans.

Table 3.
Retention Percentages for 1988-89 Through 1996-97 Enrollees Based on Self-Reported Racial/Ethnic Background from Enrollment Form.

Race/Ethnic Group	Caucasian /White	African American	Asian/ Pacific Isl	Latina/o	Other	Native Amer.
Percent Graduated	63.2	51.6	50.2	55.5	48.4	55.7
Percent Retained	69.8	59.9	59.2	61.8	62.7	63.4
Total category N	**14,873**	**1,453**	**459**	**897**	**175**	**189**

Note: Figures are reported based on students' self reported ethnicity at their time of enrollment.

Retention rates also varied by gender. Overall, retention for female students who enrolled between 1988-89 and 1996-97 was 64.7% (55.9% graduation rate), as compared to 69.9% (63.3% graduation rate) for male students enrolling during this time period. Male students comprised the majority of BLA enrollments (70.2%) during this time period.

Approximately 42% of the students who enrolled in the BLA program at Regents College between 1988-89 and 1996-97 were in the military. The retention rate for students in the military, 75.0% (69.8% graduation rate), was much higher than those for students not in the military, 62.9% (54.6% graduation rate). This was one of the more dramatic differences found in this study.

Additional analyses were conducting examining three types of variables - demographic, financial and administrative, and academic. A discriminant analysis was conducting using only graduates and withdrawn students. The results of this analysis revealed that several variables were useful in predicting group membership. These included: the number of upper level courses taken, the number of upper level arts and science credits students had at their time of enrollment, the number of social science credits students had at enrollment, military background, and GPA at enrollment. These finding largely indicate that academic preparation at the time of enrollment is related to retention at Regents College – those students with more college experience, and therefore more credits, were more likely to be retained. Military students and students with higher GPAs were also more likely to be retained.

Discussion

Retention of students in distance education programs is a complex issue, especially in the case of non-traditional students. Theories in higher education have attempted to tackle this issue, and researchers have used a variety of methods to study factors associated with student retention. This study is limited in that only variables available on a student database were examined. The results of this analysis should be viewed within the scope of previous research in this area. Retention in the Liberal Arts program at Regents College will be influenced by student characteristics as well as local environmental factors, such as family support, employer support, the student's health and financial situation, regional and national environmental factors, such as economic conditions, the job market within the student's field, as well as perceptions of service quality offered by Regents College and the availability of alternative educational opportunities.

The results of this study indicate that certain demographic characteristics are associated with retention in the Regents College BLA program. These include the educational background, ethnicity, gender, military status, and the number and type of credits the students transfer in. It should be noted that graduation rates for the Regents College BLA program are substantially higher than those reported for non-traditional students nationally. The data generated in this report provide some information about the factors associated with student retention. Exit interviews with former students are currently underway to examine some of the issues which have been described in the literature as related to adult student retention.

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INCLUDING TRANSFER-OUT BEHAVIOR IN RETENTION MODELS: USING THE NSLC ENROLLMENT SEARCH DATA

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Abstract

Almost all studies of retention inappropriately combine stopouts with transfer-outs due to a lack of data. The National Student Loan Clearinghouse has created a new database that tracks students across institutions. These data in combination with institutional databases now allow researchers to take into account both stopout and transfer-out behavior. Using NSLC data for the University of Maryland, College Park, the paper analyzes one-year retention with dichotomous and multinomial logit under two specifications: the traditional binary retained/not retained dependent variable and a three-outcome dependent variable where students are coded as retained, transferred to another institution, or stopped out. Taking into account transfer-out behavior affects not only the statistical significance of the explanatory variables but also their substantive interpretation.

Introduction

Studies of student retention at the college level are numerous and heterogeneous, taking into account various combinations of academic, financial, institutional and social factors (e.g. Bean, 1980, Manski & Wise, 1983, St. John, 1996, Tinto, 1993). All of these studies, however, have one thing in common: they view the student's decision to reenroll as a binary yes/no decision. This formulation masks the larger set of choices faced by students. After beginning college, students can decide to remain at their current institution, transfer to any number of other postsecondary institutions, or stop out and discontinue their postsecondary education altogether. The binary formulation biases any statistical results, because students who wish to finish their degrees elsewhere are inappropriately combined with students who have decided not to finish their education.

Traditional studies have combined the transfer and stopout choices together due to a lack of information. College databases only record registration and graduation activities. If a student does not appear in the database at a certain point in time, they are assumed to have stopped out or transferred and assigned that category for analysis. Tracking students who do not enroll and determining if and where they transferred is a difficult task for many institutions. Although some public university systems have developed tracking databases, these often exclude private institutions within the state and cannot track students to out-of-state institutions.

The National Student Loan Clearinghouse (NSLC) has developed a transfer student database that should revolutionize the study of post-secondary student behavior. Their Enrollment Search database allows researchers to:

1. Determine which of their students have transferred.
2. Identify the name and FICE number of the transfer institution.
3. Identify when the student first enrolled there.

By combining the NSLC data with college and university databases institutional researchers are now able to study retention in ways previously impossible.

The importance of the NSLC data can be seen in Table 1, which gives the enrollment outcomes after one year for the first-time, full-time degree seeking cohort of new freshmen who matriculated in Fall 1996. The top half of the table shows that almost 13% of the cohort did not return after one year. The bottom half of the table looks at this 13% in detail. According to the Enrollment Search data 40% of these students did not stopout but instead transferred to another institution.

The paper consists of five sections. The first section describes the NSLC data, their collection procedures and coverage. The second discusses traditional retention models and how they can be revised using Enrollment Search data to include the transfer-out option. The third section discusses other possible ways of obtaining transfer data and how to appropriately analyze discrete data with more than two outcomes. The fourth section estimates models of retention using both the traditional two-outcome and a three-outcome variable that includes the transfer-out choice and discusses the results. The last section is a summary and conclusion with a discussion of possible future research using this data.

Enrollment Search data

The NSLC acts as a central reporting agency for colleges and lenders and assists both with various aspects of student loans, such as tracking and confirming the deferment status of borrowers[1]. Member institutions periodically report enrollment information to the NSLC. Because some students may receive loans at one institution and then appear at another institution and not receive any loans, institutions report enrollment information on *all* students, not just those students receiving financial aid. The resulting data is used for their Enrollment Search program.

In the Enrollment Search program participating institutions submit the names, birth dates and dates of last attendance of students who fail to reenroll during a given semester. The NSLC takes this information and searches their database for a match among other participating institutions. If a match is found, information about when and where the student transferred is provided to the home institution. Data provided by the NSLC for each student found include the name and FICE code of their new institution, school type

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[1] See http://www.nslc.org/ for more information.

(two-year versus four-year), and transfer term begin date. As of July 1999, the NSLC had enough colleges participating (or planning to participate) that approximately 81% of the enrolled students nationwide were covered (see Table 2; National Student Loan Clearinghouse, 1999).

The current status of the Enrollment Search procedure is somewhat uncertain. In its previous iteration as "Transfer Track", institutional data requests included Social Security numbers that were then used to match with students in NSLC databases. This procedure now appears in violation of FERPA regulations and the current Enrollment Search procedure will not allow the submission of Social Security numbers for most data requests of interest to institutional researchers (Ward, 1999). NSLC believes it will achieve a very high match rate based on name, birth date and dates of enrollment, so the data will still be a very valuable resource for studies of student persistence. As of this writing the NSLC had not conducted any studies comparing match rates under the tow systems. The data used in this paper were obtained last year through the former Transfer Track program and students were matched based on their Social Security numbers.

Expanding choice sets in retention models

Numerous statistical models of persistence have been estimated over the past several decades, focusing on such varied factors as student integration and goal commitment (Allen & Nora, 1995, Cabrera, Nora, & Castaneda, 1993, Okun, Benin, & Brandt-Williams, 1996, Pascarella & Terenzini, 1980, Tinto, 1993), financial aid (Nora, 1990, St. John, 1994;St. John, 1996, St. John et al., 1990), human capital (Manski & Wise, 1983), and organizational attributes (Bean, 1980;Bean, 1983, Berger & Braxton, 1998, Nora et al., 1996). The standard approach for constructing dependent variables in these studies tracks student registration behavior from one year to the next and codes students as re-enrollees or stopouts based on registration activity. Alternatively, some researchers have used a dependent variable based on student survey responses (Berger & Braxton, 1998, Braxton et al., 1995). For example, Berger and Braxton (1998) used a five-point Likert scale ranging from "likely to reenroll" during the next fall semester to "extremely unlikely" in a survey administered to new freshmen. In both cases retention outcomes are viewed as two possibilities along one dimension: stay versus go.

Transferring to another institution is a second dimension of retention that researchers have for the most part ignored. Many students whom we treat as stopouts are actually transfer-outs. By leaving their home institutions, transfer-out students make a much different decision compared with stopouts. Transfer-outs still wish to continue their education, but for some reason they decide that finishing at another institution would help them better achieve their educational goals than remaining where they matriculated. Conversely, true stopouts decide their educational goals are best met by discontinuing their education altogether. If this is indeed the case, transfer-outs and stopouts must be treated separately in any statistical analysis. If not, combining them into one category as has traditionally been done should not pose a problem.

Research on transfer students tells us how similar these two groups of students are. Unfortunately this research has focused almost exclusively on students transferring from two-year to four-year institutions rather than students transferring out from four-year institutions. Although the student populations are quite different (Dougherty, 1992), they are analogous. Community college students who eventually earn a bachelor's degree must transfer to and complete their education at a four-year institution; similarly, at the four-year level transfer-outs leave and complete their education at another institution. Community college students who do not earn a bachelor's degree have for some reason declined to further pursue their education; stopouts at the four-year level also do not pursue their education and fail to finish their degree.

Community college students who either express an intent to transfer or who actually transfer and complete a bachelor's degree are quite different from those who do not. They come from higher socioeconomic backgrounds and do better in high school and community college (Kinnick & Kempner, 1988, Kraemer, 1995, Nora & Rendon, 1990, Pascarella et al., 1986). In addition, a study of multiple transfers (many of whom had transferred between four-year institutions) shows that they also come from higher socioeconomic backgrounds and have high academic ability (Kearney et al., 1995). Clearly the explanatory variables used in retention models will have different impacts on transfer-outs and stopouts. Therefore researchers *must* take into account the different choices faced by students when studying persistence.

Data and methodological concerns

Obtaining good data

Knowing that the choice sets of students should be expanded is of little use if the data measuring such choices is unavailable. Registration data and beginning student surveys can only provide data on whether or not the student is retained (or is planning to return) during a given semester. Researchers have tried to circumvent this problem in three ways.

The first solution uses state higher education agencies to track student movement between public two-year and four-year institutions (DesJardins & Pontiff, 1999, Ronco, 1996), but students who transfer to in-state private or out-of-state institutions are treated as stopouts (although some states track students in all institutions regardless of their public/private status).

The second solution uses an "intent to transfer" question on exit surveys of graduating students (Kraemer, 1995), but this works only at the community college level where such surveys can be made part of the graduation process. Students who do not graduate at the community college level and students who leave at the four-year level can also be surveyed. Given differences in socioeconomic background of transfer-outs and stopouts, and that the probability of survey response is often correlated with socioeconomic background, unless a high response rate is achieved such data would be of questionable use.

The third solution involves examining transcript requests and calling all institutions where a student has submitted a transcript to verify enrollment (Kraemer, 1995). Of the three this approach offers the cleanest data, but the costs can be high for larger institutions and may not be practical for many institutional researchers.

The NSLC Enrollment Search data provides a fourth solution. Member institutions can submit lists of student stopouts and for a fee obtain information about when and where they transferred. As with all data there will be some error: due to lack of complete coverage some transfers will not appear and will be coded by the researcher as stopouts, and some stopouts may be mistakenly identified as transfers. But compared to the traditional approach where only institutional data is used and all transfers are erroneously treated as stopouts, the inclusion of Enrollment Search data results in much cleaner data. Depending on the type of institution the Enrollment Search data will also be much cheaper and easier to obtain.

Statistical approach

A more complicated choice set requires a more complex statistical approach than is typically used. Discrete choice models are a class of maximum likelihood techniques that are commonly used in the social sciences to model choice behavior where the outcome, or dependent variable, is discrete rather than continuous. The familiar *logistic regression* (or *logit*), for example, is used when the dependent variable has only two outcomes, such as the traditional measure of student persistence. There are other types of discrete choice models that allow analysis of more complex educational behavior. Because many textbooks and researchers use different names for the same methodology, a brief review is in order[2].

Ordered logit models are used when the dependent variable has more than two discrete outcomes, and these outcomes can be ranked in some fashion (i.e. the data is ordinal). Bond ratings are the common example in economics research, while in the field of education opinion surveys would be another. In this approach we assume that one outcome can be ranked above another, but we know nothing about the distance between outcomes. For example, in an opinion survey there may be three responses such as "very satisfied", "somewhat satisfied", and "not satisfied at all". We know the first response can be ranked above the second in terms of satisfaction, and the second response ranked above the third, but we cannot be sure that the distance between the first and second responses is equal to the distance between the second and third. Multiple regression makes this assumption of common distance, rendering it theoretically unsuitable for such data[3].

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[2] Much of the following discussion is taken from Chapter 19 of Greene, 1997). Although his textbook is very technical the chapter on discrete choice models has a very clear narrative and is a must-read for anyone working with these techniques.

[3] Of course, in practice there may not be much difference between multiple regression and ordered logit for many applications.

There are two additional techniques that allow analysis of dependent variables with more than two discrete outcomes, but these are used when the outcomes cannot be ranked in any meaningful way (i.e. the data is nominal). The technique used depends on the data being analyzed. In the field of economics information about choices is very common. For example, analyses of commuter choice behavior will use datasets in which information varies over the commuting choices of bus, car or train. This information may take the form of cost of the commuting choice per mile, or the time of commute for each choice. These models are known as *conditional logit* models and have often been used to model educational choice after high school (e.g. Fuller et al., 1982).

The other technique for nominal data is known as *multinomial logit*, and is used when only individual-specific (versus choice-specific) data is analyzed. Using the commuter example, we may only have access to data such as income, education and occupation of the individual commuter (as well as their commute choice). Data from public opinion surveys is often analyzed using multinomial logit. Examples of this technique in the field of education include work by Keil and Partell (1999), Ordovensky (1995) and Weiler (1987, 1989).

The main drawback to multinomial logit is a restrictive assumption known as the independence of irrelevant alternatives (IIA). These models assume that if one of several alternatives was suddenly removed from the choice set, the probability of an individual choosing the remaining alternatives increases proportionally. For example, if transferring to another institution suddenly were no longer an option, the probability of transferring would be distributed equally to the options of reenrolling and stopping out. This is somewhat unrealistic, because we would assume that students who could no longer transfer would not be evenly distributed between reenrolling and stopping out; instead, most would choose to reenroll as they would wish to continue their postsecondary education.

One solution to this problem is a procedure known as *nested multinomial logit*. It is similar to regular multinomial logit except for how the choice process is viewed: simple multinomial logit treats the choice made as one among a group, while nested multinomial logit breaks the choices into branching sequential subgroups (such as enroll or stop out; if enroll, remain at home institution or transfer, etc.) (see Ordovensky, 1995, Weiler, 1987 Weiler, 1996). SuchWeiler, 1996 nesting avoids the independence of irrelevant alternatives (IIA) problem. Unfortunately this procedure demands data on attributes of the choices, such as tuition or distance, which are not available given the formulation of the data used in this study.

However, use of the IIA assumption may not be problematic for these types of studies. Weiler (1987) calculated models of educational choice using both regular and nested multinomial logit models. The substantive results for the two models were generally similar, although occasionally the size of the coefficients differed quite a bit. His study, while only suggestive, indicates that simple multinomial logit should yield fairly robust results.

One confusing aspect of multinomial models for the uninitiated is the generation of multiple sets of coefficients. For example, in this analysis there will be two sets of coefficients rather than one. This results from the nature of the dependent variable. In the binary case the coefficients are usually estimated in the form of measuring the impact of an independent variable on the probability of the yes outcome versus the no outcome. The multinomial case is exactly the same: the coefficients measure the impact of an independent variable on the probability of *one* outcome versus a *base* outcome. Since there are three outcomes and one outcome is treated as the base (or "excluded") outcome, the result is two sets of coefficients. In the context of this study the natural base category is reenrolling after one year. Note that changes in probability remain the same no matter which outcome is excluded; however, the coefficients themselves will change depending on the excluded category.[4]

Analysis

The paper analyzes one-year retention for the Fall 1996 cohort of new first-time full-time degree-seeking freshmen at the University of Maryland, College Park. In addition to the standard two-outcome enroll/not enroll dependent variable, this study uses a three-outcome variable derived from institutional databases and the Enrollment Search data. Based on their Fall 1997 registration behavior students are coded as reenrolled at UMCP, transferred to another institution, or stopped out[5]. This choice set captures the some of the complexity involved in student decision-making while remaining simple enough for a rigorous statistical analysis.

There is an extensive literature on the decision after high school to begin work on a baccalaureate degree (e.g. Fuller et al., 1982, Ordovensky, 1995, Weiler, 1987 Weiler, 1987). This decision is similar to the decision students face after one year in college and the same theoretical and statistical tools can be used. The theoretical model is a human capital approach, where students are assumed to view their educational choices as investment decisions (Becker, 1975). Simply put, students compare the costs and benefits of obtaining an education at a particular institution versus other institutions and immediately participating in the labor market and make the choice that will maximize their utility, generally conceived as their lifetime earnings[6]. Students' choices will differ because individual attributes of the students will affect both the return and the costs of their educational investment.

Explanatory variables are divided into four groups: demographics, human capital, uncertainty, and costs (see Table 3; descriptive statistics are given in Table 4).

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[4] The probabilities do not change because different formulas are used for different outcomes depending on which outcome is excluded. See Greene (1997) p. 875.

[5] Note that these are *presumed* stopouts, because we have no knowledge of their educational behavior in Fall 1997.

[6] National surveys indicate that students indeed "view higher education less as an opportunity and more as a means to increase their incomes" Bronner, 1998. In the 1998 HERI survey of first-time, full-time freshmen, 74.9% of respondents cited "to be well off financially" as their educational goal.

Demographic variables are simply used as controls and include the student's age, gender, minority group status and international student status.

The human capital variables measure the amount of "capital" the students have to invest by obtaining a baccalaureate degree. Students with greater capital will earn higher returns from attending college. In the case of one-year retention these students should prefer continuing their education to stopping out, so students with greater academic ability should be more likely to be retained. Five variables capture various aspects academic ability: Scholastic Aptitude Test scores, high school grade point average, the number of college credits at matriculation, living on campus during the first semester and participation in an honors program.

The inclusion of living on campus and honors participation may appear controversial because these variables are often treated as "safety net" programs that directly affect student behavior. Implicit in this formulation, however, is the assumption that students who participate are no different than those who do not, so any differences in behavior between the groups are due to the effect of participation. This is clearly not the case. Admission to an honors program is dependent on academic aptitude, and studies have shown that students who choose to live on campus have higher socioeconomic status and higher high school grade point averages (Levin & Clowes, 1982). These variables are more measures of student background than program impacts and are treated as such.

As with any decision, students are somewhat uncertain as to the exact benefits a post-secondary education will bestow. Students with greater certainty about the benefits should be more likely to be retained. While direct measures of uncertainty are not available, the number of days between the date of application and the first day of class in Fall 1996 can be used as a proxy. Students who are more certain that they wish to pursue a bachelor's degree and that the University of Maryland offers the best return on their investment compared to other alternatives should tend to apply earlier than those who are not.

Finally, the benefits accrued from higher education must be greater than the costs, so students facing higher costs should be more likely to pursue alternatives (either working or attending a less costly institution) and less likely to be retained. Four variables measure the costs faced by students. Indirect costs such as lack of family support are measured by whether the student was a first generation college student. Other indirect costs such as being far away from family and friends are proxied by the student's residency status, in-state versus out-of-state. The direct costs of attending the university are measured by the amount of unmet need (the amount of money needed by the student after their financial aid package has been taken into account), and the total amount of debt taken on by the student. Because not all students apply for financial aid, an indicator variable is included to measure possible differences between the two groups.

The purpose of this analysis is simple: does the expansion of students' persistence choice set add to our understanding of persistence behavior? Taking into account the transfer-out option requires more data and more complex statistical tools. If our understanding of retention remains the same then nothing is gained. The remainder of the paper attempts to answer this question.

Which model is "better"?

Table 5 presents the results for the two retention models. The first column lists the coefficients and standard errors for the traditional binary retention model where students are classified as retained or not retained as of the Fall 1997 semester. Note that for comparison purposes the values of the dependent variable have been reversed, so the model is estimating the probability of a student *not* being retained instead of the usual being retained. The next two columns list the results for the multinomial logit model of retention. The excluded or base outcome is retained in Fall 1997, so results are given for two outcomes: stopping out and transferring. With these formulations the coefficients are comparable across the models.

We need some sort of criteria to decide between the two approaches to modeling retention. At least two criteria are relevant: predictive ability and explanatory power. Predictive ability is the ability of the model to correctly predict the outcomes of the dependent variable. Explanatory power, on the other hand, has a different connotation in the context of this paper. Explanatory power refers to what the model tells us about student behavior (*not* "what percentage of the variance is explained."). Are students who live on campus during their first semester more likely to return to the university after a year? Models that can answer these types of questions can be said to have good explanatory power. Obviously explanatory power, unlike predictive ability, cannot be measured directly and is more of a judgement call.

The distinction between the two criteria is important because models can have high predictive power and little explanatory power, and vice versa. A simple example makes this clear. Suppose two analysts estimate dichotomous logit models on a dataset where the overall retention rate is 80%. The first analyst uses a typical group of variables such as demographics, SAT scores, etc., while the second uses only a constant.

Next, an evaluation committee examines the models to determine which one should be used for policy-making purposes. They discover that the standard retention model correctly predicts student retention outcomes only 45% percent of the time, while the constant model predicts correct outcomes 80% of the time (this follows from the construction of the model, because all students are predicted to be retained and 80% actually are retained). The committee rejects the first model and decides to use the second model for their decision-making because of its superior predictive ability. They ask the second analyst, "What does your model tell us about student behavior?" The answer, of course, is nothing, because the model consists only of a constant. The first model, although a poor predictor of retention, nonetheless can offer interesting information about the impact of various variables on student behavior. This example illustrates the difficulty in relying on predictive power for these types of models, because one can easily develop highly predictive models with little explanatory power.

Predictive ability

From the likelihood ratio indices at the bottom of Table 5 we can conclude that the multinomial model appears to fit the data better than the dichotomous model.[7] However, if some type of intervention system for at-risk students is under consideration, the real measure of predictive ability is the proportion of outcomes correctly predicted. An institution does not want to waste intervention resources on students who are likely to stay, and they also do not want to miss applying the intervention to those at-risk students who are likely to stop out. Here the multinomial model performs poorly, because the sample used is what Greene (1997, p. 892) terms "unbalanced". An unbalanced sample has cases that are not evenly distributed across outcomes. This poses a problem because the base probability for an outcome for every individual will be the relative frequency of that outcome. If the relative frequency is very high or low, then only an extraordinary number of regressors could cause the predicted probability of this outcome to shift above or below the predicted probabilities of the other outcomes.

Because of the unbalanced sample, predicting outcomes in the multinomial model is difficult. Like the dichotomous case, a predicted probability for each individual student and each outcome can be derived from the model coefficients. We can use two different decision rules for predicting outcomes based on these probabilities. First, the outcome with the highest predicted probability can be declared the predicted outcome. Unfortunately with this sample every student is predicted to be enrolled all three semesters, because the predicted probability for this outcome is always in the 70%-90% range, much larger than all the other outcomes. Second, we can compare the predicted probability of each outcome with the actual relative frequency for each outcome. For example, if the predicted probability of stopping out for a student is 8%, this student is assigned this outcome because 8% is greater than the actual relative frequency (or sample mean) of 7.51%. Unfortunately for many students in the sample *two* outcomes are predicted using this decision rule. That is, one outcome has a reduced probability, and since the sum of the probabilities for the three outcomes must sum to 1, this probability is often shifted to two other outcomes rather than just one. The result is ambiguous predictions for many individuals in the sample. Unfortunately the multinomial approach does not seem very useful for actually predicting student outcomes; however, in a more balanced sample the multinomial approach might prove superior to dichotomous logit.

Explanatory power

What the model tells us about student behavior is the second criteria by which to judge the two approaches. Here the differences between the two models are quite interesting. In the dichotomous model four variables have a statistically significant impact on the probability of not enrolling. Students with higher grade point averages, who live on campus and who applied early are more likely to reenroll after one year, while students with unmet need are less likely to reenroll.

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[7] The likelihood ratio index is calculated as 1 – (log likelihood of the full model / log likelihood of a model estimated with only a constant) and is bounded from zero to one (Greene 1997, p. 891). It can be thought of as representing the increase in the log likelihood due to the addition of explanatory variables.

When the choice of not reenrolling is broken down into not reenrolling by stopping out and not reenrolling by transferring, the results are quite different. As in the dichotomous case, two variables still have a significant impact on both stopping out and transferring: application time and unmet need. Students who applied late and students with large unmet need are both more likely to either stopout or transfer. High school grade point average, however, only affects stopping out. In addition, three variables insignificant in the dichotomous model are now significant. First generation college students are less likely to stopout, while in-state residents and participants in the Honors program are less likely to transfer.

The substantive meaning of these results can be seen in Table 6, which presents the change in probability of an outcome occurring given a change in an independent variable[8]. Changes in probability were calculated from the model coefficients as follows. The predicted probability of reenrolling was calculated using the sample means for all independent variables except the variable for which the change is calculated. That variable is constrained to the value indicated. The process was repeated using the second value of the independent variable and the difference between the two probabilities was taken. For example, the impact of housing on retention was estimated by calculating the predicted probability with the on campus variable set to zero rather than the sample mean; this was repeated with on campus set to one and the difference taken.

The probabilities of enrolling for the two models are listed in the first two columns and are similar, as expected. The one major difference is that the multinomial changes are all slightly smaller than the dichotomous logit changes.

Because of a fundamental axiom of probability theory, when the probability of reenrolling increases by a certain amount, the probability of not reenrolling must decrease by the same amount. This can be seen in the third and fourth columns of Table 6, which list the changes in the probability of stopping out or transferring. Note that the differences (which are bolded) in these two columns sum to the negative probability of reenrolling in the second column. Here the advantage of using of the Enrollment Search data combined with the multinomial logit model can be seen. The impact of changes in the explanatory variables on the overall probability of not reenrolling can be "broken out" into two parts: the effect on the decision to stopout and the effect on the decision to transfer. In doing so we can now distinguish between factors that affect the decision to *discontinue* post-secondary education and the decision to *continue* by attending another institution.

Changes in high school grade point average illustrate this point. When grade point average increases from 3.0 to 4.0 the probability of reenrolling increases about seven percentage points; as theorized, students with greater academic ability are more likely to be retained. The third and fourth columns of Table 6 show that the impact is not the same on the decision to stopout and the decision to transfer. The impact of high school grade point average is much larger for the stopout alternative than the transfer alternative. Living on campus is similar, while the impact of honors program participation is more evenly split between the two alternatives (although not significant for the stopout alternative). The results indicate that academic ability chiefly affects a student's decision to continue with their educational investment, and has little to do with their decision to transfer.

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[8] These changes are sometimes referred to a "delta-p's" (Petersen, 1985).

The effect of uncertainty as measured by application time and direct costs as measured by unmet need appear fairly similar for both stopping out and transferring. Application time captures both decision-making aspects faced by students. Students who know they want a college degree will tend to apply earlier, and students who believe that UMCP will provide the best education for them compared to alternative institutions will both tend to apply early. Similarly, as the direct cost of education rises some students will react by deciding that investing in a college degree is not worth the cost. Others will decide it is worth the cost, but their site of investment is too costly in comparison with alternative post-secondary institutions.

The impacts of first generation college student and residency are quite different when taking into account the transfer-out option. In the dichotomous case neither variable is significantly related to persistence, but in the multinomial case first generation status significantly affects the probability of stopping out and residency is significantly related to the probability of transferring.

The effect of being a first generation college student on stopping out is counter-intuitive. First generation college students are more likely to be retained, not less likely as most people would expect, and this is related to the decision to stopout. These results are confirmed by the raw data. The one-year retention rate for these students is 94% compared with 87.4% for the entire cohort. There are two possible explanations for this result. The first involves the application process. It is possible that the applications of students who identify themselves as first generation college students are carefully evaluated to make sure that these students possess the ability to succeed. If such filtering takes place then the variable would tend to be a proxy for those factors listed on their application or in their essay that are associated with successful students but that are not recorded in institutional databases. The second is that these students are flagged as at-risk students and receive more advising than the average student.

Students from out of state are three percentage points more likely to transfer than students who are Maryland residents. From a human capital perspective this result makes sense. Students from out of state are farther away from home and face greater psychological and monetary costs associated with distance, such as separation from family and travel expenses. In addition, out of state students generally have one or more lower priced educational alternatives in their home state.

The estimated results in general agree with the predictions of a human capital model of student persistence behavior. Uncertainty and direct costs affect both the decision to continue and the decision to transfer. Academic ability affects whether a student continues to pursue their degree, but not whether they transfer. Residency status affects the decision to transfer to another institution only.

Conclusion

Students in higher education face many decisions while pursuing their degree. Two of the most fundamental are whether to finish, and whether to finish at the institution where they matriculated. Only by disentangling these decisions can institutional researchers hope to gain a greater understanding of persistence behavior. The results presented here indicate that NSLC's Enrollment Search data in combination with internal databases are a practical alternative to the traditional binary outcome approach. Taking into account transfer-out behavior affects not only the statistical significance of the explanatory variables but also their substantive impact.

Many researchers build extremely complex models of retention that completely overlook transfer behavior. Given the difference in results when using the three-outcome persistence variable, these researchers must begin to consider transfer-out behavior when estimating their models. Failure to do so will result in biased estimates and the wrong conclusions about what affects student behavior. Given that over a quarter of students who students who begin their post-secondary education at a four-year institution transfer to another (McCormick & Carroll, 1997), transfer-out behavior cannot be ignored.

Future research in this area should focus on expanding student choice sets even further. Besides facing decisions about continuing their education and staying at their home institution, students must make other decisions. Should I get a four-year degree or settle for an associate's degree? Should I attend an institution in my home state or transfer to an out-of-state institution? Such decisions can easily be analyzed using the Enrollment Search data and a multinomial logit model.

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Table 1. One-Year Persistence of Fall 1996 Freshmen Cohort

Student group	Fall 1997 outcome	%	N
Entire cohort	Enrolled	87.4	3,105
	Not enrolled:		
	Unknown outcome (stopouts)	7.5	267
	Transferred to:		
	Maryland 4-year	0.5	17
	Maryland 2-year	1.4	51
	Out of state 4-year	2.0	70
	Out of state 2-year	1.2	43
		100.0	3,553
Only not enrolled	Unknown outcome (stopouts)	59.6	267
	Transferred to:		
	Maryland 4-year	3.8	17
	Maryland 2-year	11.4	51
	Out of state 4-year	15.6	70
	Out of state 2-year	9.6	43
		100.0	448

Source: NSLC and University of Maryland, College Park databases.

Table 2. Coverage Rates of Enrollment Search Data

State	Total enrollment	Active participants	Preparing participants	Total participants	% share
Alabama	229,511	169,800	3,200	173,000	75.4%
Alaska	31,500	30,000	0	30,000	95.2%
Arizona	274,932	124,000	19,800	143,800	52.3%
Arkansas	96,294	82,100	2,500	84,600	87.9%
California	1,835,791	1,719,500	137,050	1,856,550	100.1%
Colorado	241,295	210,300	0	210,300	87.2%
Connecticut	159,990	126,600	0	126,600	79.1%
Delaware	44,197	22,200	3,200	25,400	57.5%
District of Columbia	77,705	43,800	5,566	49,366	63.5%
Florida	634,237	363,200	133,400	496,600	78.3%
Georgia	308,587	226,500	11,700	238,200	77.2%
Hawaii	64,322	2,800	0	2,800	4.4%
Idaho	60,393	39,000	13,200	52,200	86.4%
Illinois	731,420	589,000	90,700	679,700	92.9%
Indiana	292,276	89,400	0	89,400	30.6%
Iowa	172,450	97,300	0	97,300	56.4%
Kansas	170,603	76,200	12,100	88,300	51.8%
Kentucky	182,577	170,200	4,000	174,200	95.4%
Louisiana	203,567	170,400	8,300	178,700	87.8%
Maine	56,724	45,300	0	45,300	79.9%
Maryland	266,214	176,100	41,900	218,000	81.9%
Massachusetts	416,505	312,900	15,770	328,670	78.9%
Michigan	551,307	292,000	0	292,000	53.0%
Minnesota	289,300	258,500	0	258,500	89.4%
Mississippi	120,884	92,000	18,000	110,000	91.0%
Missouri	293,810	255,200	240	255,400	86.9%
Montana	42,000	36,500	1,800	38,300	91.2%
Nebraska	116,000	95,800	2,000	97,800	84.3%
Nevada	64,085	41,000	0	41,000	64.0%
New Hampshire	62,847	41,200	0	41,200	65.6%
New Jersey	335,480	205,600	0	205,600	61.3%
New Mexico	101,881	12,000	55,100	67,100	65.9%
New York	1,057,841	957,100	100	957,200	90.5%
North Carolina	369,386	334,900	20,400	355,300	96.2%
North Dakota	53,000	41,000	0	41,000	77.4%
Ohio	549,304	445,000	1,126	446,126	81.2%
Oklahoma	185,174	111,000	7,600	118,600	64.0%
Oregon	164,447	133,400	500	133,900	81.4%
Pennsylvania	611,174	554,600	0	554,600	90.7%
Puerto Rico	75,000	0	260	260	0.3%
Rhode Island	74,718	40,300	13,900	54,200	72.5%
South Carolina	173,070	156,000	4,800	160,800	92.9%
South Dakota	38,500	36,000	0	36,000	93.5%
Tennessee	242,966	226,700	400	227,100	94.2%
Texas	954,495	600,600	93,100	693,700	72.7%
Utah	146,196	109,300	3,000	112,300	76.8%
Vermont	43,870	29,800	500	30,300	69.1%
Virginia	354,149	284,900	68,000	352,900	99.6%
Washington	284,662	239,200	2,000	245,200	86.1%
West Virginia	87,741	51,800	0	51,800	59.0%
Wisconsin	303,861	284,300	0	284,300	93.6%
Wyoming	42,300	32,000	0	32,000	75.7%
Total	**14,340,538**	**10,888,300**	**787,242**	**11,675,542**	**81.4%**

Table 3. Variable Names and Descriptions

Variable type	Variable name	Description
Demographics	Age	Age at time of matriculation (in years).
	Female	Coded 1 if female, 0 otherwise.
	Nonwhite	Coded 1 if the student was a minority or international student, 0 otherwise.
	International	Coded 1 if the student was not a U.S. citizen or permanent resident, 0 otherwise.
Human capital	Combined SAT	Combination of the highest math and verbal Scholastic Aptitude Test scores submitted by the student.
	HS GPA	High-school grade point average.
	Credits	Number of credits brought by the student at matriculation.
	On campus	Measures whether the student resided on campus their first semester, coded 1 if so, 0 otherwise.
	Honors	Coded 1 if student participated in the university Honors program, 0 otherwise.
Uncertainty	Application time	Number of days between the first day of classes and the date of the student's application.
Costs	First generation	Taken from the student's application, coded 1 if student indicated s/he was first in family to attend college, 0 otherwise.
	MD residency	Residency based on tuition status, coded 1 if Maryland state resident, 0 otherwise.
	Unmet need	Amount of money needed by the student to cover costs of attending the university during FY 1997. Positive amounts indicate need, negative amounts indicate no need. Students who did not apply for financial aid have missing data for this variable; they are assumed to have zero unmet need and are coded 0.
	Total debt	Total amount of debt accrued by the student during FY 1997.
	Aid flag	indicator variable coded one if student did not apply for financial aid, 0 otherwise.

Table 4. Independent Variables – Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
Age	18.178	0.954	16	46
Female	0.486	0.500	0	1
Nonwhite	0.350	0.477	0	1
International	0.017	0.131	0	1
SAT combined	119.280	14.425	57	160
HS GPA	3.450	0.495	1.84	5.05
Credits	0.224	1.009	0	12
On campus	0.810	0.392	0	1
Honors	0.358	0.479	0	1
Application time	262.035	45.809	1	599
First generation	0.023	0.151	0	1
MD residency	0.641	0.480	0	1
Unmet need	-1754.999	8705.377	-80746	16612
Total debt	2261.384	3361.137	0	18573
Aid flag	0.214	0.410	0	1

Table 5. Dichotomous and Multinomial Logistic Regression Estimates

	Dichotomous	Multinomial	
	P(not enrolling)	P(stopping out)	P(transferring)
Age	-0.0401	-0.0174	-0.1503
	(0.0485)	(0.0507)	(0.1280)
Female	0.0886	0.0704	0.0879
	(0.1095)	(0.1385)	(0.1636)
Nonwhite	-0.0972	-0.0945	-0.0883
	(0.1269)	(0.1582)	(0.1929)
Foreign	-0.4698	0.1240	-1.7417
	(0.4268)	(0.4699)	(1.0488)
SAT combined	0.0029	0.0105	-0.0094
	(0.0048)	(0.0060)	(0.0074)
HS GPA	-0.7970***	-1.1580***	-0.2567
	(0.1353)	(0.1709)	(0.2016)
Credits	-0.0218	0.0071	-0.0989
	(0.0544)	(0.0626)	(0.1011)
On campus	-0.4446***	-0.6955***	0.0291
	(0.1397)	(0.1648)	(0.2394)
Honors	-0.3912*	-0.2217	-0.6171*
	(0.1627)	(0.2077)	(0.2461)
Application time	-0.0049***	-0.0053***	-0.0044**
	(0.0011)	(0.0013)	(0.0017)
First generation	-0.8342	-2.0053*	0.0345
	(0.4742)	(1.0157)	(0.5363)
MD residency	-0.1949	0.2207	-0.7322***
	(0.1172)	(0.1541)	(0.1725)
Unmet need	0.000032***	0.000032**	0.000031**
	(0.000008)	(0.000011)	(0.000012)
Total debt	0.000011	0.000029	-0.000013
	(0.000017)	(0.000021)	(0.000024)
Aid flag	0.0991	0.0974	0.0955
	(0.1374)	(0.1747)	(0.2030)
Intercept	2.9523*	2.2336	3.5953
	(1.2195)	(1.3791)	(2.6828)
N	3,553	3,553	
Log likelihood	-1253.73	-1525.46	
Model chi-square	184.91***	245.90***	
Likelihood ratio index	0.069	0.075	

Note: standard errors in parentheses; * p<.05, ** p<.01, *** p<.001.

Table 6. Change in Probability of Retention Outcomes for Significant Independent Variables

	Dichotomous	Multinomial		
	P(enrolling)	P(enrolling)	P(stopping out)	P(transferring)
High school GPA = 3.0	85.5%	86.2%	9.4%	4.5%
High school GPA = 4.0	92.9%	93.1%	3.2%	3.7%
Difference	**7.4%**	**6.9%**	**-6.2%**	**-0.7%**
Resided off campus	85.5%	86.3%	9.8%	3.9%
Resided on campus	90.2%	90.7%	5.1%	4.2%
Difference	**4.7%**	**4.3%**	**-4.7%**	**0.3%**
Not enrolled in Honors program	88.0%	88.7%	6.2%	5.1%
Enrolled in Honors program	91.6%	92.0%	5.2%	2.9%
Difference	**3.6%**	**3.3%**	**-1.0%**	**-2.2%**
Applied six months	84.9%	85.7%	8.6%	5.7%
Applied twelve months	93.2%	93.6%	3.6%	2.8%
Difference	**8.3%**	**7.9%**	**-5.0%**	**-2.9%**
Unmet need = $20,000	80.9%	82.0%	10.5%	7.4%
Unmet need = $0	88.9%	89.5%	6.1%	4.4%
Difference	**8.0%**	**7.5%**	**-4.4%**	**-3.1%**
Not first generation college	-	89.8%	6.1%	4.1%
First generation college	-	94.6%	0.9%	4.5%
Difference	-	**4.8%**	**-5.2%**	**0.4%**
Out-of-state resident	-	88.5%	5.0%	6.5%
Maryland resident	-	90.5%	6.3%	3.2%
Difference	-	**2.0%**	**1.4%**	**-3.3%**

Note: probabilities calculated using coefficients from Table 5 and sample means.

IMPLICATIONS OF AGE ON SUCCESS IN COMPUTER-BASED REMEDIAL EDUCATION

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The Developmental Studies Laboratory (DSL) at the Montgomery County Community College (MCCC) offers computer-based courses for students needing remedial education in English, mathematics, and reading. The program was originally designed to provide a self-paced and self-directed remedial option for students requiring greater flexibility than traditional course-based classes offer.

As part of a recent evaluation of the DSL, it became apparent that it is an effective form of remedial education with its students doing equally as well as students enrolled in traditional developmental courses. The one major weakness of the DSL identified during the evaluation is an excessive withdraw rate. Students in the DSL are between two and three times more likely to withdraw from these courses than from traditional developmental courses.

Issues revolving around the withdraw rate are particularly important because the DSL has a limited number of positions for students, and each semester students are unable to enroll in its courses because they are full.

Background:

The issue of developmental or remedial education is currently a topic of educational interest, particularly for community colleges with 41% of students at public two-year institutions taking remedial courses (US Department of Education, 1998). Unfortunately, little research on effective developmental education has been conducted (O'Hear and MacDonald, 1995; Taraban, 1996).

One clear feature of developmental education is the role of students' age. According to the Institute of Higher Education, over 50% of students enrolled in remedial courses are over 22 years old, and 25% are over 30 (Institute for Higher Education Policy, 1998). In their recent Chronicle of Higher Education article, Breneman and Haarlow argue that developmental education is not simply for academically deficient recent high school graduates, but includes older students needing to "brush up" on basic skills before enrolling in college-level courses (Breneman and Haarlow, 1999).

Another major feature of developmental education is the increasing role of technology. Computer- assisted learning is becoming an increasing common option for all students (Molnar, 1994). Technology has moved from providing system-driven tutorials to student-focused on-line courses (Romiszowski, 1994). Although there is limited literature on the use of this format for remedial education, it was shown that age positively and significantly effected performance in a computer-based remedial format (Cox, 1990).

MCCC Developmental Studies Laboratory

The DSL offers computer-based course options for students who are not prepared to enter college-level courses as determined by MCCC Placement Test Office. Students complete courses that are equivalent to traditional developmental courses operating with a semester time frame, although there is greater flexibility for completion due to the absence of structural (e.g. course meetings) limitations. The motivating factor in developing the DSL was to provide an option for students who do not meet MCCC's minimum academic prerequisite standards for college-level courses, but are unable to succeed in the traditional course-based developmental model. Particular reasons from the original proposal include insufficient time devoted to concepts with which students have difficulty, the courses progressing too slowly or rapidly for individual students, and difficulty attending the scheduled courses meetings.

There is no set time schedule for students, but they are expected to make adequate progress toward completion of the course throughout the semester. Enrollees receive three written progress reports, and between two and five telephone calls throughout the semester indicating their progress.

In addition to the computer-based learning format, the DSL provides tutors to help students experiencing difficulty with specific course content. As of spring 1999, there are 15 tutors who worked in the lab. There are generally two tutors available for students, one for mathematics and one for English and reading.

The DSL offers six different courses during the academic year. These courses have been phased in over the last five years, and have witnessed steady growth during the lab's existence. Table 1 outlines the courses currently available through the DSL and their enrollment during spring 1999. Typically some students are unable to register for DSL sections in English and mathematics because the sections reach capacity.

Table 1: DSL Courses and Enrollments

Course	Spring 1999 Enrollment
Mat010-Fundementals of Arithmetic	40
Mat011-Beginning Algebra	40
Eng010-Basic Writing I	10
Eng011-Basic Writing II	10
Rea090-Elements of Reading	4
Rea018-Fundementals of College Reading	4

The computer lab is physically located in MCCC's Learning Resource Center to provide a central location for enrollees. The lab is open seven days a week during the school year (six during summer sessions). There are 35 computers, which adequately meet the current demands of enrollees. Additionally students in traditional courses are permitted to use the lab's resources for assistance with their work.

Administratively, a facilitator oversees the day-to-day operations of DSL. While not a faculty member, the facilitator is chiefly responsible for the students involvement with the DSL and their final performance evaluation.

Methods:

Data: The first data source was collected during the Office of Institutional Research's evaluation of the DSL program. During the process, DLS tutors were surveyed about their perceptions of the Lab and its students. Data about the characteristics of successful students was collected through two open-ended questions:

- What types of students fare better in each mode? and
- What type of students should not be enrolled in a DSL course?

Using MCCC's administrative data-system, students enrolled in DSL mathematics (Mat010-Fundamentals of Arithmetic, Mat011-Beginning Algebra) and English (Eng010-Basic Writing I, Eng011-Basic Writing II) courses between fall 1995 and spring 1999 were identified. A total of 55 English students, and 117 math students were extracted. Student's performance (grade) in the DSL courses and age were extracted into the data set for analysis. MCCC's DSL reading courses were not examined because of low numbers of students who have enrolled in and completed the courses.

Analysis: Analysis of the comments of DSL counselors was conducted by thematically coding each comment to the two questions. Themes were then categorized to determine common characteristics of successful DSL students. These characteristics served as the basis for the following quantitative analysis.

To understand the role of age in withdrawing from DSL courses, a categorical examination of withdraw rates was conducted by comparing withdraw rates for students under 21 years old to students 21 and older. After determining the existence of a relationship, it was studied further using simple linear regression (SLR) to determine if age significantly predicted the students' performance for those who completed the courses. Students' performance was measured through the standard academic scale (A=4, B=3, C=2, D=1, and F=0).

Results:

Analysis of the tutors' comments regarding successful DSL students shows they have a general maturity, good time management skills, and self-discipline. Results from the question regarding students who did not fare well in the DSL concur with the first open-end question, and show students lacking the above characteristics tend to withdraw from the DSL course or not perform well in it.

For all four courses examined older students have lower withdraw rates than younger colleagues. Table 2 highlights each courses withdraw rate by age group. The most pronounced difference was found in Math 010, with nearly 20% more older students completing the courses than younger students.

Table 2: Withdraw rate for DSL courses by age

	Withdraw Rate		Withdraw Rate
Math 010 (n=102)		English 010 (n=97)	
20 and younger	44.4	20 and younger	60.7
21 and older	26.7	21 and older	53.6
Math 011 (n=145)		English 011 (n=86)	
20 and younger	48.0	20 and younger	45.9
21 and older	45.3	21 and older	34.7

Moving onto performance within DSL courses, age predicts students' final grades. For both English and math courses, students' increased age significantly and positively raised their performance in DSL courses. Table 3 highlights the relevant statistics generated from the SLR.

Table 3: Regression analysis age predicting performance in DSL sections

Course	Constant	B	T	t sig	R^2
English (n=95)	1.434	.042	2.775	.008	.127
Mathematics (n=148)	1.205	.048	3.246	.002	.084

Discussion:

The qualitative data from this study show that for successful participation in computer-based remedial education, students should possess general maturity, self-discipline, and good time management skills. All three of theses attribute, while not necessarily limited to older students, are often correlated with age.

The quantitative results from the study support the comments offered by DSL tutors. Younger students are less likely to complete DSL courses than older students. These computer-based courses, which are designed to provide a self-paced educational experience, require students' to have self-discipline and motivation to complete the courses successfully. The inflated withdraw rate for younger students (compared to older students) indicates that these students may lack the self-direction needed to complete the courses which do not have the structure provided by the traditional classroom setting.

The second major finding from the data emerges when examining students who completed DSL courses. Older students do better in DSL courses than their younger colleagues. Again, because the courses are self-directed they require self-discipline to prepare adequately for the student-scheduled tests and evaluations. Older students appear to have the necessary discipline and motivation to perform better in the computer-based format.

Conclusion and Implications:

The data show that older students are more successful in computer-based developmental courses having higher completion rates and better performance. While it is inappropriate for an institution to limit students' access to any courses based on their age, there are direct policy implications for conducting a computer-based developmental laboratory from this study.

First, it may be advantageous to target computer-based remedial options specifically to non-traditional students through campus groups and academic advising.
Second, there might be value in informing prospective students about the role of age in completion and performance, to help them make informed decisions about their participation in these computer-based courses. By providing prospective students information about the value of self-discipline and the correlation to age in successful completion of DSL course, students could make a more informed choice about determining if the option is appropriate for their learning style.

Through focused recruitment and screening efforts, it may be possible to limit the withdraw rates for computer-based developmental courses. Hopefully, these strategies will encourage students who will be successful to participate in the courses, while limiting those who will not benefit from it.

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FACTORS IN EARLY COLLEGE ACADEMIC PERFORMANCE: DOES RACE MATTER?

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Introduction

This research investigates whether race matters in the early academic performance of college students. Regression analysis is used to determine whether controlling for socioeconomic status, prior academic performance, standardized test scores, demographic characteristics, and certain enrollment characteristics eliminates the differential between African-American and White academic performance.

Literature Review

The stratification literature regards education as a double-edged process. On the one hand, education provides training, which fosters mobility. On the other, it produces stratification by assigning students to groups and in so doing fixes these assignments for use by others. In the second group, Weber (1920/1948) argues that educational institutions perform a closure function, excluding less wealthy students from the top positions in society. Weber (1920/1948) maintains that the expense and time an education requires puts it beyond all but the wealthy. Jencks, et. al. (1972), however, argue that the stratification created through education is really not a question of closure, but of sorting by desire and ability, with personal characteristics being more important than external factors. Education, then, can be seen as providing mobility opportunities to those suited to take advantage of them and denying them from those who are not.

Bidwell and Friedkin (1988) offer an approach to educational achievement that synthesizes this solution to the mobility/closure dilemma. Their approach explains the differential educational achievement of students using the perceived costs and benefits to students of participating in education. In this context, education is seen as painful, partly because of grading and testing. Students weigh their participation in education based on the relationship of this pain to the perceived benefits. Students who perceive education as less painful, who have a high tolerance to the pain of education, or who perceive the benefits of education to be high, will be more willing to participate in and to succeed in their educational pursuits. In this model, the idea of costs encompasses the financial costs of education as well as its painful aspects. For example, this approach may explain why Smith and Allen (1984) find that college students living on campus perform better than those living off campus. The costs of involvement in on-campus academic life would be higher for off-campus students.

Bidwell and Friedkin (1988) propose that differences in academic achievement by SES can be explained by differences in student preferences related to socialization. For example, high-SES parents may emphasize the benefits and downplay the costs of education, or apply sanctions to poor performance. This may lead students to value educational achievement more, either as a thing in itself or as a means to avoiding sanctions. Similarly, high-status groups, who wish to close off opportunity to all but themselves, would tend to make education as costly as possible, both financially and psychically, without excluding members of their own group.

One potential difference in the benefits and costs of education between African-American and White students could be discrimination. Discrimination in higher education institutions can create a psychically costly environment for African-Americans (Anderson 1994). While admitting that overt discrimination in the United States has declined dramatically in the last half of this century, Bonilla-Silva (1997) argues that discrimination has become covert. This is because the society still is racialized, that is, racism is still a fundamental part of social structures. More punishing college environments may result from such racialization through overt and covert discrimination, increasing the psychic costs of attendance and achievement for African-American students, while not adding to the costs of attendance for other groups. This would be an ideal closure system for White consumers of education, since it does not threaten to limit access to them.

Wilson (1978), however, views stratification in America is moving away from stratification based on racial differences to stratification based on class differences. While racial stratification may be declining, it has not disappeared. According to Bonilla-Silva's (1997) notion of the racialized society, racial stratification continues to flourish in the United States because of covert discrimination.

Conley (1999) argues that differential wealth maintains the racial stratification in American society. Housing segregation and lack of access to credit prevent African Americans from building wealth, obtaining high-quality primary and secondary education, and attending college. Segregation excludes African Americans from the social networks that are a resource for white citizens looking for employment or opportunity. Conley (1999) states that race per se is not the cause of these inequalities, but that racial discrimination generally works only in conjunction with lack of wealth to undermine the life chances of African Americans. Class and wealth are the predominant factors.

The covert racial discrimination described by Bonilla-Silva (1997) could cause the difference in academic achievement and success between African-American and White students by raising the cost of participation in college for African-American students. If differences in academic performance are not explained by differences in socioeconomic status, then the explanation of differential success can be explained only by two causes: (1) real differences between African-American and White students or (2) higher costs of participation in higher education (e.g., discrimination) for African-American students than White students. Clearly, the literature leaves open the question, "Does race matter in college academic performance?"

Empirical Research

The empirical research on race, socioeconomic status, and educational outcomes tends to support one of four positions: (1) academic factors prevail over race and SES in determining educational outcomes; (2) socioeconomic and racial factors act indirectly on outcomes through academic factors; and (3) socioeconomic and academic factors prevail over race in determining outcomes; and (4) racial factors determine outcomes independent of socioeconomic or academic factors.

Representative of research supporting the first position, Astin (1971) concludes that socioeconomic status and race do not influence academic performance. Astin (1971) explores the predictive power of various student background, academic, and personal characteristics on freshman academic performance and finds that high school grade-point average and standardized test (e.g., the SAT) scores are the two most important factors, together explaining 27 percent of the variation in freshman college grade-point average. Adding college selectivity and 13 personal characteristics to the model explains 35 percent of the variation. Neither race nor socioeconomic status produces significant regression coefficients in any of his models.

Crouse and Trusheim (1988) also investigate the predictive power of SAT scores and high school class rank on freshman college grade-point average using data from the National Longitudinal Study. Using simple regression, they find that high school class rank explains 17 percent of the variation in freshman college grade-point average, the best fit of any single variable used in the analysis. SAT scores alone explain 14 percent of the variation in freshman grade-point average, but when added to the model with high school class rank, the model explains 21 percent of the variation. Socioeconomic status is not used in this study, but the results confirm that high school academic performance and college aptitude as measured by SAT scores are useful statistical controls for academic ability and aptitude in studies of academic outcomes.

Research by Smith and Allan (1984) also supports the primacy of academic variables in academic performance. They also find that living on campus is positively correlated with academic performance. This finding supports the cost-benefits approach to educational participation because on-campus students face lower costs for participating in their education.

Research supporting the second position, that socioeconomic and racial factors act indirectly on educational outcomes, is more sophisticated and more prevalent. Typical of this research is Boughan and Clagett (1995), who show that while socioeconomic status (SES) and race are not significant direct predictors of academic success, SES does explain variation in important variables intervening between SES and student achievement, such as credit hour load and need for remediation. These relationships pertain even when academic preparedness is controlled.

Similarly, Hauser, Tsai and Sewell (1983) find that the causal effects of socioeconomic status (SES) on educational attainment are mediated through the influence of the aspirations of individuals, their families, and friends. They also find SES to be a strong predictor of educational attainment. A reduced model containing only SES and high school academic performance produced a coefficient of determination (R2) of .63. But despite the large total role SES plays in status attainment, Hauser, Tsai, and Sewell (1983) conclude that its direct effects on academic attainment are small or nonexistent.

Conley (1999) recently has provided some exploratory evidence for the third position, that socioeconomic and academic factors prevail over race in determining outcomes. Conley (1999) finds the same negative correlation between race and academic attainment as many other researchers, even when the models control for SES using family income. However, when SES measured as wealth is included in the models, the negative relationship between African-American race and educational attainment disappear and even become positive in some cases (Conley 1999). This is consistent with Wilson's (1978) and Hout's (1984) findings that stratification based on race has been declining and stratification based on social class has been increasing historically through the twentieth century.

Research supporting the fourth position, that racial factors determine outcomes independent of socioeconomic or academic factors, generally focuses on outcomes such as retention and graduation. It is well established that African-American college students are less likely than White students to persist in college and earn a bachelor's degree (Horn and Maw 1995, National Center for Education Statistics 1995, Tinto 1993). Horn and Maw (1995) find that differences in persistence between African-American and White students remained after academic background (e.g., high school grade-point average), family income, and other background variables are controlled. While Horn and Maw's (1995) findings generally support the direct effects of race on outcomes, they also find the variables that affect college retention and graduation the most for African-American students tend to be correlated with socioeconomic status.

In summary, prior research in college academic performance and status attainment reports a variety of conclusions about the importance of race and socioeconomic status (SES) in college academic performance. While the research in college academic performance notes the importance of high-school academic achievement and standardized test scores (Astin 1971; Crouse and Trusheim 1988), it generally concludes that race and SES do not appear to have any direct impact on college academic performance (Astin 1971; Boughan and Clagett 1995). However, the literature also concludes that African-American students are less likely to persist and succeed in college than white students, and that the variables affecting success for these students are correlated with SES (Horn and Maw 1995).

Theoretical Propositions and Research Hypotheses

While great changes in the racial structure of American society have occurred in the past half century, these probably have not eliminated all of the bias in its institutions. Therefore, using the cost-benefits perspective, African-American (i.e., low racial status) students should perform less well than White (i.e., high racial status) students, other things being equal. Using this perspective, I have formulated the following theoretical propositions about the effects of race and socioeconomic status on college academic performance:

Proposition 1: Race-status and academic performance are positively correlated.

Proposition 2: Socioeconomic status and academic performance are positively correlated.

Proposition 3: Race-status and academic performance are positively correlated exclusive of the influence of socioeconomic status.

The following research hypotheses were derived from the propositions:

H_1: In a multiple regression analysis of college academic performance that controls other factors but excludes the independent variable parents' income, the estimated regression coefficient for the variable indicating African-American race is statistically significant and less than zero.

H_2: In a multiple regression analysis of college academic performance that controls other factors but excludes the variable indicating African-American race, the estimated regression coefficient for parents' income is statistically significant and greater than zero.

H_3: In a multiple regression analysis of college academic performance that includes both African-American race and parents' income as independent variables and that controls other factors, the estimated regression coefficient for the African-American race variable is statistically significant and less than zero.

Methodology

This project uses a multivariate statistical design, regression analysis, to determine how socioeconomic status and race influence first-semester college grade-point average, the dependent variable. The independent variables controlled in each of these analyses are age, combined SAT, female gender, high educational aspirations, high-school class rank, residential status, and special admission status.

Data Sources

Student records from the subject institution, a small, comprehensive public liberal arts university in the Northeast, supply the data required for this project. The sample of students used for the study includes all members of the fall 1996 entering cohort of first-time full-time freshmen (FTFTF) who (1) have a valid response to the new student survey item used in the study, (2) have valid data for each of the other variables included in the study, and (3) are either African American or white. There are 207 students in the sample out of 695 FTFTF. Examination of demographic characteristics demonstrate that the sample is generally similar to the FTFTF entering class, but overrepresents females, whites, younger students, and on-campus residents.

Results

The results of the regression analyses performed to test the hypotheses are summarized in Table 1. A fourth regression model is included to assess the indirect effects of the demographic variables.

Model 1 tests the first hypothesis, that African-American race is negatively correlated with initial college grade-point average when parents' income is excluded from the model. This hypothesis is supported by the results of the regression analysis. The estimated standardized regression coefficient (beta) for the variable indicating African - American race is -.1052. It is statistically significant at the .05 level. Figure 1 is a scatterplot that illustrates the difference in GPA between African-American and white students when high-school class rank is controlled.

Model 2 tests the second hypothesis, that parents' income correlates positively with initial college grade-point average when the variable indicating African-American race is excluded from the model. This hypothesis is not supported by the results of the regression analysis. The estimated standardized regression coefficient (beta) for parents' Income is not statistically different from zero.

Model 3 tests the third hypothesis, that African-American race correlates negatively with initial college grade-point average when parents' income is included in the model. This hypothesis is supported by the results of the regression analysis. The estimated standardized regression coefficient (beta) for the variable indicating African-American race is -.1037. It is statistically significant at the .05 level.

Model 4 was estimated to test the total effects of demographic variables on grade-point average when the intermediate aspiration and academic preparedness variables are not included. The model shows that none of the demographic variables except African-American race has any significant effect. The standardized coefficient (beta) for African-American race is -.1487, or 43 percent larger than in the full model (Model 3). The academic variables (combined SAT, high-school rank, admission status, and educational aspirations) clearly explain a large part of the zero-order correlation between African-American race and grade-point average.

Table 1
Regression of first-semester grade-point average: standardized coefficients (beta weights) and model statistics

Variable	Model 1 Parents' Income Excluded	Model 2 African American Excluded	Model 3 Full Model	Model 4 Demo-graphic Variables
African American[a]	-.1052 *	--	-.1037 *	-.1487 *
Age	.1009 *	.0964	.1020 *	-.0165
Combined SAT	.2529 *	.2749 *	.2526 *	--
Female[a]	.0531	.0508	.0531	.0182
High educational aspirations[a]	-.0406	-.0485	-.0407	--
High-school class rank	.3859 *	.3765 *	.3880 *	--
On-campus resident[a]	-.0070	-.0171	-.0065	--
Parents' income (in thousands)	--	.0252	.0097	-.0608
Special admission[a]	.0973	.0873	.0982	--
Model statistic				
R^2	.2520	.2425	.2521	.0227
Adjusted R^2	.2217	.2119	.2179	.0034
Number of cases	207	207	207	207

*$p < .05$

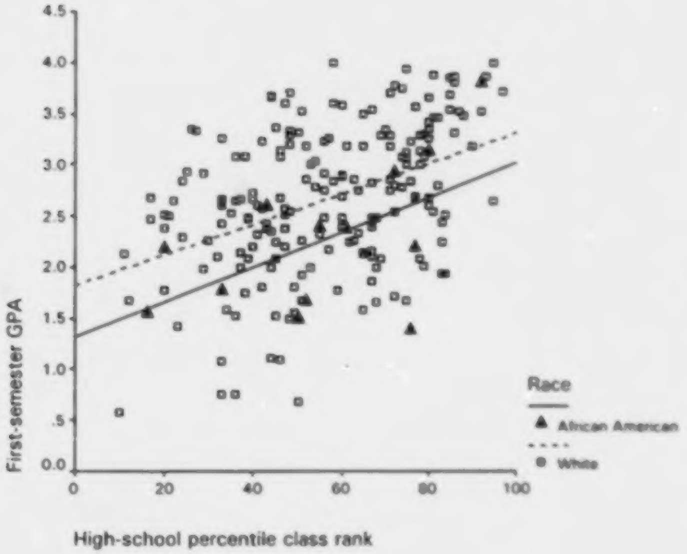
[a] Dichotomous "dummy" variable

In addition to the indicator of African-American race, other variables were significant predictors of first-semester grade-point average. High-school class rank and combined SAT were also predictive, with standardized coefficients of .3880 and .2526 in the full model. These two variables had significant, positive coefficients in all three models that include them. Age is also significantly correlated in the positive direction with grade-point average in Models 1 and 3, with coefficients of .1009 and .1020, respectively.

Variables found to have effects in other studies, such as sex (Astin 1971) and housing status (Smith and Allen 1984), have none in these models. Also, variables predicting educational attainment in Hauser, Tsai, and Sewell (1983), such as SES and educational aspirations, do not have any effects. Admission under special admissions programs does not have any significant effect on GPA when the other factors in the model are controlled.

Figure 1

Scatterplot of first-semester GPA by high-school percentile class rank for African-American and white students



In summary, the results of the regression analysis indicate that African-American race but not SES predicts first-semester college grade-point average. SES is not predictive even when academic variables (e.g., high-school rank) are removed from the model. Thus, Hypothesis 1 and Hypothesis 3 are supported by the analysis, and Hypothesis 2 is not.

Discussion

The disposition of the hypotheses bears on the theoretical propositions from which they were derived.

Proposition 1: Race status and academic performance are positively correlated. Race status is positively correlated with academic performance. The relationship, however, is a weak one. The standardized coefficient (beta) for African-American race is only -.1052 in Model 1. While this statistic is statistically different from zero, it denotes a weak correlation. Any correlation, however, is inconsistent with the findings of much of the research in this area, such as Astin's (1971) study of predictors of freshman college grade-point averages and Boughan and Clagett's (1995) study of student success. This finding argues for the possibility of racial discrimination in the academy, as suggested by Bonilla-Silva's (1997) idea of covert racial discrimination and Anderson's (1994) description of bias in academe.

Proposition 2: Socioeconomic status and academic performance are positively correlated. Socioeconomic status (SES) does not appear to be correlated with academic performance. This is consistent with the findings of research in status attainment and academic success, such as Hauser, Tsai, and Sewell (1983), Astin (1971), and Boughan and Clagett (1995).

Proposition 3: Race status and academic performance are positively correlated exclusive of the influence of socioeconomic status. Since socioeconomic status (SES) is not a factor in academic performance, race status does appear to be correlated with academic performance exclusive of the influence of SES. This is consistent with the research on race, persistence, and educational attainment, such as that of Horn and Maw (1983) and the National Center for Education Statistics (1995). The strength of the relationship between African-American race and grade-point average is very weak, but only very slightly weaker than it is when parents' income is not controlled. The standardized coefficient (beta) for African-American race is -.1037 in Model 3, only .0015 or 1 percent less than in Model 1. Thus, SES does not explain the relationship between African-American race and grade-point average.

The research supports the first and third propositions. Initial academic performance is correlated with race status, exclusive of the effects of SES. However, SES has no influence on academic performance.

The following statements can be made about the findings of the study:

1. African-American students perform less well in their first semester of college than white students, even when differences in academic preparedness are controlled.

2. Differences in academic performance by race can be explained by either racialization of higher education institutions (e.g., discrimination against African-American students in college) or social and cultural differences.

3. This study does not have the measures to distinguish between these causes.

This study cannot disentangle the effects of these potential causes. However, it is clear that there are real differences between the academic potential of African-American and white students whether they are caused by discrimination or not. This is a significant finding, and one that contradicts the common wisdom regarding academic performance.

Conclusions

This study found that African-American students perform less well in their first semester of college than white students, even when academic and socioeconomic factors are controlled. While the causes of this performance deficit are unclear, it is possible that it is the result of covert racial discrimination or racialization in higher education institutions. Alternative explanations link differences in the support for and the valuing of education among African-Americans to poorer academic performance. Only further research will untangle the causes of these racial differences in performance.

Implications

The implications of this study for higher education policymakers are fairly clear: socioeconomic status cannot be used in place of race as the criterion in affirmative action programs. For whatever reasons, African-American students are still at a disadvantage with respect to white students in college academic performance and educational attainment. Despite evidence about the declining significance of race and the increasing importance of class, race still matters.

The empirical and theoretical contributions of this research are less clear. It has successfully questioned the conclusion that simply controlling for academic preparedness or socioeconomic status eliminates the performance deficit of African-American students. However, no firm conclusions on the causes of this performance deficit have been found. Deeper solutions will have to be sought into the social factors influencing academic performance, such as the support and aspirations of significant others and the value students place on education.

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THE MISSION OF INSTITUTIONAL RESEARCH

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Abstract

Mission statements can provide a useful vehicle to communicate the purposes, goals, and objectives for functional units within organizations. To describe institutional research in higher education, a content analysis was performed on mission statements of institutional research offices within NEAIR. This paper presents the findings of the study.

Introduction

In a monograph publication for the Association for Institutional Research, Saupe (1990) defined institutional research (IR) as "research conducted within an institution of higher education to provide information which supports institutional planning, policy formation, and decision making" (p.1). Institutional research, according to Saupe, is a form of "action research" that often involves close interaction with institutional clients in the collection, analysis, and interpretation of data. Saupe describes additional responsibilities or tasks that may be assigned to the IR office "which need not be considered research on the institution" (p. 6), such as data collection and management for both internal and external reporting.

Several studies have described the tasks and functions of institutional research. Clemons and Nojan (1987) conducted a study of beliefs about institutional research among managers and senior administrators at 17 large, multi-campus, state-supported institutions. They found strong beliefs among senior administrators and IR managers that the functions of IR offices should include data collection, analysis, maintenance, and dissemination; state and federal reporting, policy-oriented research, defining institutional databases, projecting enrollment, and measuring outcomes.

Through an innovative approach, Boyles (1988) conducted a content analysis of IR position advertisements that were published in the "Chronicle of Higher Education" from 1970 to 1985 to describe, among other things, the responsibilities of positions within offices of institutional research. Boyles found the primary functions of IR during the 1970s were the collection, maintenance, and dissemination of information. During this period, the function of IR expanded to include various comparative studies and reporting to external agencies. By the late 1970s, the position advertisements began to include support for campus planning activities as a function of the IR office.

Other studies have documented differences in the roles and tasks of IR offices on the basis of institutional characteristics, the size of the office, and its reporting location within the organization (Delaney, 1990; Harrington, 1995; Reichard, 1982; Volkwein, 1990). Reichard (1982), in a survey of AIR members, found that IR offices at doctoral-granting or comprehensive institutions were more involved in academic research studies while their counterparts at baccalaureate and two-year institutions were more involved in environmental analysis studies and outcomes assessment. In a research study of north east institutional research offices, Delaney (1990) found that IR offices at private institutions were more engaged than public institutions in advanced research projects, while public institution IR offices placed more importance on outcomes assessment. In addition, Delaney (1990) reported four-year institutions were more likely than two-year institutions to conduct research, planning and policy studies. In a separate study of north east offices of institutional research, Volkwein (1990) reported that two-year institutions were more actively involved in assessment processes than four-year institutions.

Mission statements can provide a communication vehicle to define the scope of operations and the purposes, goals, and objectives of organizational units. Mission statements have the potential to clarify interests, define core activities, and help to set priorities for functional units within organizations.

What is the mission of institutional research? Studies have been conducted in other functional units of higher education (Stearns and Borna, 1998), but the literature is bereft of such studies for offices of institutional research. The purpose of this study is to describe the functions of institutional research by reviewing the published mission statements of research offices. Other questions to be addressed include the extent to which mission statements exist for IR offices, and whether the content of mission statements varies by institutional characteristics.

Methodology

Content analysis is "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Holsti, 1969, p. 14). Content analysis involves selecting a written message to be studied, developing categories for measurement, and measuring frequency of appearance of the categories by using coding rules. The definition of IR offered by Saupe (1990) and the description of IR tasks and functions documented in other research studies provided the "desired characteristics" for measurement. Mission statements were analyzed to determine the presence or absence of each of the following characteristics: planning support, decision making support, policy formation support, assessment support, conducting research studies, data management, data analysis, internal and external reporting. The following definitions or examples were used to measure the presence of each characteristic:

Planning Support: Examples included coordinating, facilitating, or providing information or analyses to support planning activities on the campus.

Decision making Support: Examples included providing information for decision making, supporting decision making, or informing decision making.

Policy formation support: Examples included policy analysis, providing data, information, or research for policy-related issues.

Assessment support: Examples included coordination for assessment, accountability, or self-study processes, or providing data analysis or research for these processes.

Conducting research studies: Examples included descriptions of specific types of research or analytical studies, such as student opinion research, survey research, or enrollment management research.

Data Management: Examples included references to database management systems, or the collection, organization, maintenance, or verification of data.

Data analysis: References to the analysis or interpretation of data.

External reporting: Examples included federal or state reporting, providing data for guidebook or other external organizations.

Internal reporting: Examples included presentation of data, publication of reports, dissemination of data or information to constituencies within the institution.

The population for this study included research offices at institutions within the north east region. The 1998 NEAIR membership roster provided the sample for the study. Institutions selected for the study included those with "research" or "analysis" in the office title. An email survey was sent to one person from each institution, typically the director of institutional research. The email survey asked the respondent to identify the title of the office, whether the office had a published mission statement and, if so, to provide the mission statement for content analysis. Of 179 possible institutions, only 167 were eventually included in the study. The remaining 12 institutions were not included in the study because the office title did not include research or analysis (such as Registrar) or because of bad email addresses.

Results

Table 1 provides the response rate and availability of published mission statements by institutional control and level. Overall, 86% of the institutions responded to the survey, representing 86% of the public and 87% of the private institutions from the original sample. By level, 87% of the four-year institutions and 83% of the two-year institutions responded to the survey.

Of those who responded, 44% of the institutions provided published mission statements for their IR offices. Four-year institutions were slightly more likely to have published mission statements as compared to two-year institutions, 45% and 40% respectively.

Table 1
Response Rates and Frequency of Mission Statements By Institutional Control and Level

	N	% Responding	Number with Mission Statements	% with Mission Statements (of those responding)
Combined	167	86%	63	44%
Public	90	86%	34	44%
Private	77	87%	29	43%
4 year	119	87%	47	45%
2 year	48	83%	16	40%

The office titles of those institutions providing mission statements are shown in Table 2. About half of the offices were titled as "institutional research". Another 29% of the institutions included "planning" in the office title with institutional research. Other variations incorporated "assessment" in the title of the office.

Table 2
Frequency of Office Titles

Office Title	N	%
Assessment & Institutional Research	2	3%
Institutional Assessment & Research	1	2%
Institutional Planning & Analysis	1	2%
Institutional Research	30	48%
Institutional Research & Academic Planning	1	2%
Institutional Research & Analysis	1	2%
Institutional Research & Assessment	1	2%
Institutional Research & Budget	1	2%
Institutional Research & Planning	10	16%
Planning & Institutional Research	7	11%
Planning & Research	2	3%
Planning, Assessment, & Research	1	2%
Planning, Assessment, Research, & Academic Support	1	2%
Planning, Research, & Grants Management	1	2%
Research	1	2%
Research & Planning	1	2%
Strategic Planning & Institutional Research	1	2%
Total Offices	63	100%

Table 3 presents the frequency of the desired characteristics found through the content analysis of the mission statements. The most frequently occurring functions for institutional research described in the mission statements were internal reporting (92%), planning support (76%), external reporting (67%), and conducting research studies (62%). Over half of the mission statements included references to data management (57%) and providing support for assessment activities (56%) and decision making (56%). The least frequently mentioned functions of IR in the mission statements were data analysis (40%) and support for policy formation (38%).

Table 3
Proportion of Mission Statements Exhibiting Desired Characteristics

	Level		Control		Combined
Characteristic	4-year (N=47)	2-year (N=16)	Public (N=34)	Private (N=29)	(N=63)
Internal reporting	89%	100%	97%	86%	92%
Planning support	74%	81%	76%	76%	76%
External reporting	79%	31%	65%	69%	67%
Conduct research studies	70%	38%	47%	79%	62%
Data management	57%	56%	68%	45%	57%
Decision making support	55%	56%	56%	55%	56%
Assessment support	45%	88%	71%	38%	56%
Data analysis	34%	56%	32%	48%	40%
Policy formation support	43%	25%	35%	41%	38%

Several statistical differences were found in the content of mission statements on the basis of institutional level and control. The mission statements of IR offices at two-year institutions were more likely than four-year institution mission statements to describe support for assessment activities as an office function ($X^2 = 8.86, p<.01$). The mission statements of research offices at four-year institutions, on the other hand, were more likely to describe specific research studies ($X^2 = 5.42, p<.02$) and external reporting ($X^2=12.1, p<.01$) as functions of institutional research.

In comparing mission statements by institutional control, the mission statements of the IR offices at public institutions were more likely than mission statements at private institutions to include the function of support for assessment ($X^2=6.76, p<.01$). The mission statements of IR offices at private institutions were more likely to include references to specific research efforts ($X^2 =6.90, p<.01$).

For those mission statements that included types of research studies, Table 4 provides the areas of research conducted by those offices. Of those mission statements that included references to research activities, 57% described specific research efforts for assessment-related activities. Examples of the assessment-related research studies included surveys of student outcomes and evaluation studies for assessing institutional effectiveness.

Other types of research studies frequently described in the mission statements included student opinion research (32%), and academic research (30%). About 24% of the mission statements specifically referenced research studies that would broadly fall into the categories of enrollment, benchmarking, or environmental scanning.

Research studies for student outcomes and assessment were significantly more frequently included in the IR mission statements of two-year institutions compared to four-year institutions (X^2=5.48, $p<.02$). In addition, the mission statements of IR offices at two-year institutions included references to environmental research studies significantly more often than four-year institutions (X^2 =6.26, $p<.02$).

Table 4
Types of Research Studies

	Level		Control		Combined
Area of Research	4-year (N=33)	2-year (N=6)	Public (N=16)	Private (N=23)	(N=39)
Assessment	48%	100%	88%	35%	57%
Student opinion	33%	17%	25%	35%	32%
Academic (faculty, workload)	30%	33%	50%	17%	30%
Enrollment	21%	33%	38%	13%	24%
Benchmarking	24%	17%	19%	26%	24%
Environmental scanning	18%	67%	31%	22%	24%
Campus issues	24%	0%	13%	26%	22%
Survey research	24%	0%	19%	22%	22%
Policy	21%	17%	25%	17%	22%
Planning	18%	17%	19%	17%	19%
Finance	12%	33%	25%	9%	16%
Decision making	12%	17%	19%	9%	14%
Staffing	6%	0%	6%	4%	5%
Facilities	3%	0%	6%	0%	3%

In comparing mission statements by institutional control, the mission statements of IR offices in public institutions were more likely than private institutions to describe assessment-related research studies (X^2 =10.67, $p<.001$). The mission statements from IR offices at public institutions were more likely than private institutions to include descriptions of academic-related research activities (X^2 =4.71, $p<.03$).

Discussion

The purposes for this study were to determine the extent to which institutional research offices utilize mission statements to communicate office functions and tasks and to identify those functions and tasks through content analysis. The use of mission statements as a communication vehicle to define tasks and functions appears to be an established practice among research offices. Nearly half of the respondents surveyed provided mission statements for analysis. Moreover, other office directors indicated through private email that they would be developing mission statements for their offices in the near future.

The results of this study suggest that the tasks and functions for institutional research are consistent with the description of institutional research advanced by Saupe (1990). The majority of mission statements for research offices reviewed through content analysis described the IR functions of support for institutional planning and decision making, assessment, conducting research, data management, and providing information to internal and external constituencies.
To a lesser degree, the mission statements for institutional research offices also referred to the responsibilities for data analysis and support for policy formation decisions.

Prior studies have reported differences in the tasks and functions performed by research offices based on institutional characteristics (Delaney, 1990; Reichard, 1982; Volkwein, 1990). Results of this study suggest that mission statements for institutional research also vary based on institutional characteristics. The mission statements of research offices at two-year colleges more frequently describe involvement in assessment-related processes and research, consistent with the findings from previous studies. Demands for public accountability may explain the greater presence of assessment-related functions in the IR mission statements of public versus private institutions.

The mission statements of IR offices at four-year institutions more frequently mention external reporting as compared to the two-year colleges. The inundation of guidebook and ranking surveys that often land in the IR offices of four-year institutions may explain why nearly 80% of the mission statements of four-year institutions describe external reporting as a function of institutional research.

The types of studies conducted by institutional research offices also vary by institutional characteristics. The IR mission statements of two-year institutions reinforce the findings of prior research studies that reported that two-year institutions were more likely to conduct assessment and environmental scanning research. Results of the content analysis of IR mission statements also demonstrated a greater frequency of assessment-related research at public institutions.

It should be noted that this study describes the content of published mission statements and does not necessarily reflect the actual activities of IR offices. An IR office may be conducting research in specific areas but did not include references to that research in their mission statement. Future research efforts may seek to measure the congruency between the functions and tasks described in mission statements and actual activities conducted through the institutional research office.

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THE IMPACT OF REMEDIAL MATHEMATICS COURSES ON STUDENT COLLEGE-LEVEL MATHEMATICS PERFORMANCE AND PERSISTENCE

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Introduction

This study of remedial mathematics courses at West Chester University was undertaken at the request of the Developmental Education Task Force, which Dr. Skerl chaired and which had representatives from the Mathematics Department, English Department, and developmental education support services. The Task Force was charged by the Provost to review the structure and effectiveness of remedial mathematics and English courses and to propose alternative structures if warranted by the review.

West Chester University requires all students to take a college-level mathematics course and two college-level composition courses as part of their general education requirements. SAT scores and a placement exam are used to determine whether students must first be placed in a zero-level remedial mathematics or remedial composition course before being permitted to enroll in 100-level mathematics or English courses, which are the college-level required courses. Students must pass the zero-level remedial courses with a C- or better before they are permitted to enroll in the 100-level courses.

Although a very large percentage of entering freshmen at WCU are placed in these courses (about one-third in English and fourteen percent in Mathematics remedial programs), (causing some resistance among students, parents, and faculty advisors,) there had been no comprehensive evaluation of the effectiveness of these courses since their inception over 20 years ago. Therefore, the Task Force asked Dr. Zhai from Institutional Research & Planning to study the impact of remedial programs. Results and analyses presented in this paper are one component of larger study.

As pointed out by Weissman, Bulakowski and Jumisko (1997): "The purpose of remedial courses is to enable students to gain the skills necessary to complete college-level courses and academic programs successfully." Based on these guidelines, this study tried to examine the following issues: (1) To what extent are the remedial mathematics courses effective in preparing students for their college-level required mathematics courses? (2) To what extent do the remedial mathematics courses contribute to students' academic success as shown by their retention and graduation rates?

Methodology

Data

Student course grades for the remedial and college-level math courses were used in this study. Remedial students' SAT Math (SATM) scores, their enrollment status and graduation records were also obtained. Data were taken from the University's historical snapshots and the Student Flow Models maintained by the Office of Research and Planning. This study covers the period from fall 1992 to summer 1998.

Selection of the Comparison Group (Control Group)

One of the major challenges facing the evaluation of remedial course impact in this four-year public institution is the lack of student comparison groups due to the remedial course placement policy adopted by the university. For this study it is assumed that, in order for a remedial program to be judged effective, it ought to help some students succeed who otherwise would most likely fail their college-level coursework. It was also assumed that, if the mathematics remedial program can help some under-prepared students to succeed, it would fulfil its function.

In order to ensure reasonably informative comparisons, the control or comparison group used for this study were those students who scored no more than 50 points higher than the SATM cutoff score for placement into the remedial program. The cutoff score for remedial mathematics was 450 before the recentering of SAT in fall 1996 and 480 after the recentering. As a result, the placement score for the control group was SATM 501 before the recentering and 531 after the recentering.

Definition of Terms

Student Groups:

- **remedial group** - students who took at least one remedial math course during their matriculation in the University
- **control group** - students who were placed out of remedial program, with SATM of 500 or lower
- **college-ready** - students whose SATM scores were higher than 501/531

Admission Status:

West Chester University admits students in four categories: regular admission and three categories of special admissions for those students who do not meet the criteria for regular admission: Academic Development Program Act 101, Academic Development Program non-Act 101, Motivation. The minimum qualification for each category are as follows:

- **Regular Admit:** Academic program continued into senior year; combined SAT of 1000; High School Rank 50%; and Honors or AP classes a plus
- **Academic Development Program Act 101 (ADP Act 101)**: Verbal SAT 380; Math SAT 340; High School Rank 40%; and GPA 2.0
- **Academic Development Program Non-Act 101 (ADP Non-Act 101)**: Similar as ADP Act-101, but without special financial assistance
- **Special Admit Motivational (Special Admit)**: Verbal SAT 480; Math SAT 450; High School Rank 60%; and GPA 2.7

It is NOT the intention of this study to compare developmental students with other college-ready students. Information concerning other students was included in this study for reference only.

Outcome Measures

Three major outcome measures were employed to assess the impact of the remedial program. They are: (1) college-level Math performance; (2) second-year retention rates and (3) six-year graduation and retention rates. Outcome measures were collected and compared between remedial students and students in the control group.

Statistics

Chi-square statistics were used to compare student course passing rates between remedial students and the control group. A grade of C- or better was considered a passing grade. One-way ANOVA was used to detect course performance differences on college-level Math work. Due to the large sample size (2,563 records for remedial programs and 19,988 for college-level courses), all statistical analyses yielded significant statistical results even when the magnitude of the difference was of little practical concern (for example a GPA of 2.50 vs. 2.58). As a result, statistical results were not reported. Instead, emphases were placed on the practical application of the findings when pertinent. Detailed statistical results are available upon request.

Results and Analyses

Performance on College-Level Math Work

The first measure used to assess the remedial program's impact on student performance on college-level math work was completion rates. Table 1 presents student course completion rates between remedial students and students in the control group.

able 1. Comparisons of Student Math 100-Level Course Completion Rate

			Math 100-Level Course Grades		
			Pass (C- or Better)	Fail (Below C-)	Total
Student Group	Remedial Students	Count	1125	928	2053
		% within gro	54.8%	45.2%	100.0%
	Control Group, SAT below 500/530	Count	2956	1790	4746
		% within gro	62.3%	37.7%	100.0%
Total		Count	4081	2718	6799
		% within gro	60.0%	40.0%	100.0%

According to Table 1, 55% of remedial students successfully completed their college-level math work, compared with 62% in the control group. For those remedial students who successfully completed their college-level math, their performance was very comparable with that of the control group. Table 2 illustrates this result.

Table 2. Comparisons of Student Performance on College-Level Math (Grade of C- or Better)

Math 100-Level Course Grades

Student Group	Mean	N
Remedial Students	2.51	1125
Control Group, SATM below 50	2.58	2956
Total	2.56	4081

This results confirms the findings by Weissman, Silk and Bulakowski (1997), who found that although the average GPA for students who had remediated was not as high as that of college-ready students, remediated students performed at above a C average in their college-level courses.

A second focus used in examining the remedial math course' impact on student college-level coursework performance was its timing. In order to determine if the timing of the course made a difference in their performance on the subsequent college-level math work, course tracking analyses were carried out. Tables 3 and 4 present the course-tracking results. Table 3 compares remedial students' college-level course performance in fall semesters after they took the remedial coursework in the previous spring semesters. Table 4 gives similar information as in Table 3, but for courses offered in spring semesters, with remedial students taking remedial coursework in the immediate-past fall semesters. It was anticipated that students might perform better at their college-level math work if the time lapse between the remedial and college-level coursework was short.

Table 3. Comparisons of Student Performance for Math 100-Level Courses Offered in Fall Semesters
(With Remedial Coursework (RC) Completed in Previous Spring Semester)

Term for College-Level Coursework	RC Previous Spring Semester			No RC[1] SATM < =500			No RC SATM >500			Total	
	Count	%	Average SATM	Count	%	Average SATM	Count	%	Average SATM	Count	%
Fall 1993	**RM in Spring 1993**										
Fail	18	52.9	362	472	76.5	489				490	33.4
Pass	9	26.5	401				818	100	527	827	56.3
Withdraw	7	20.6	417	145	23.5	499				152	10.4
Total	34	2.3		617	42.0		818	55.7		1469	
Fall 1994	**RM in Spring 1994**										
Fail	15	55.6	384	545	100	489				560	33
Pass	4	14.8	410				927	82.8	525	931	55.1
Withdraw	8	29.6	389				192	17.2	504	200	11.8
Total	27	1.6		545	32.2		1119	66.2		1691	
Fall 1995	**RM in Spring 1995**										
Fail	17	42.5	394	517	67.2	490				534	29.5
Pass	12	30.0	400				1002	100	522	1014	56.0
Withdraw	11	27.5	385	252	40.8	493				263	14.5
Total	40	2.2		769			1002			1811	
Fall 1996	**RM in Spring 1996**			**No RM SATM < =530**			**No RM SATM >530**				
Fail	20	50.0	377	617	71.0	495				637	31.6
Pass	11	27.5	374				1104		531	1115	55.4
Withdraw	9	22.5	376	252	29.0	495				261	13.0
Total	40	2.0		869			1104			2013	
Fall 1997	**M0 in Spring 1997**										
Fail	14	41.2	417	522		508				536	27.9
Pass	14	41.2	448	1114		530				1128	58.7
Withdraw	6	17.7	434	253		508				259	13.5
Total	34	1.8		1889						1923	

According to Table 3, there were 1,469 students taking college-level math courses in fall 1993. Of the 1,469, 34 (2.31%) were enrolled in Math remedial courses in spring 1993. There were 617 (42%) students whose SATM was below 500, but who were not enrolled in the remedial courses in spring 1993.

There were two possibilities for these 617 students not taking remedial coursework in the previous semester: (1) they were placed out of the remedial course, or (2) they might have taken the course prior to spring 1993. Regardless, Table 3 shows that none of these 617 students passed college-level courses (472, i.e.76.5% failed and 145, i.e. 23.5% withdrew) in fall, 1993. The average SATM was 489 for the 472 students who failed the college-level math courses. The average SATM for the 145 students who withdrew from their college-level coursework was 499. There were 818 students whose SATM scores were above 500, and all of them passed their college-level courses in fall, 1993. Their average SATM was 527.

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[1] This does NOT indicate that people in this group did not take remedial courses at all. It only suggests that students in this group did not take remedial course work in the immediate-past semester.

Table 3 also shows that in fall 1993, 33.4% (490) failed their college-level math courses, 56.3% passed, and 10.4% withdrew. For the remedial students, their average course passing rate was 26.5% and their failure rate was 52.9%. Except for the semester in fall 1997, remediated students' college-level coursework passing rates were about 30% or lower. Even for the remediated students who did pass their college-level mathematics coursework, their SATM scores tend to be higher than their peers from the remedial courses who failed their college-level coursework.

Taking a closer look at Table 3, the pattern of passing and failure becomes even more obvious. The SATM average for the 9 students who took the remedial courses in the immediate past semester and passed their college-level coursework was only 401, much lower than the SATM average of 527 for the college-ready group. For the 18 students who took remedial math in spring, 1993 and failed their college-level courses in the following fall semester, their SATM average was only 362. In general, Table 3 reveals that the SATM averages for the remedial students who failed their college-Math coursework in spite of remedial course tend to be below 400 before the recentering and 420 after it.

Table 4 presents a somewhat different story. First of all, the course passing rates for the remedial students were much higher than those presented in Table 3 (Average passing rate was > 45%). Secondly, for the remediated students, the difference in SATM between those who passed the college-level coursework and those who failed seemed to become smaller (except for the spring 1993 group).

Table 4 confirms one finding revealed by Table 3: The failure rates tend to be high for students with relatively low SATM and no remedial coursework in the immediate-past semesters. For example, according to Table 3, the failure rates for this group of students were 77% for fall, 1993, 100% for fall, 1994, and 67% for fall, 1995. In Table 4, the failure rates for students in that group were 77% for spring, 1993, 76% for spring, 1994 and 100% for spring, 1995.

Further exploration in course-taking patterns show that most of the students taking remedial coursework in spring semesters were repeating the course whereas the number of students enrolled in fall semesters who were repeating the course was very small (See Table A in the Appendix.).

It was anticipated that when the time lapse between remedial and college-level math work was short, remediated students might perform better. Given the remedial course-repeating factor by students for remedial courses offered in spring semesters (Table A in the Appendix), given the fact that students who failed their college-level coursework in spite of the remedial coursework in the spring semesters, no conclusions were made in terms of the effect of timing for the remedial courses even though students taking remedial coursework in fall followed by college-level coursework in spring did tend to have higher course passing rates than those taking remedial coursework in spring and college-level coursework in fall, with a summer break in between.

Nevertheless, this low SATM scores and remedial course repeating confounded factors did inform us that when a student SATM was too low, even two semesters of remedial coursework were not enough to help him/her get prepared for the college-level math work.

Table 4. Comparisons of Student Performance for Math 100-Level Courses Offered in Spring Semesters

With Remedial CourseWork (RC) Completed in the Immediate Past Fall Semester

	RC Previous Fall			No RC SATM < = 500			No RC SATM > 500			Total	
Term For Math 1xx	Count	%	Average SATM	Count	%	Average SATM	Count	%	Average SATM	Count	%
Spring 1993	**RM Fall 1992**										
Fail	31	38.8	383	366	76.1	482				397	30.1
Pass	44	55.0	421	115	23.9	483	769		518	928	69.8
Withdraw	5	6.3	435							5	0.4
Total	80			481						1330	
Spring 1994	**RM Fall 1993**										
Fail	49	38.3	404	399	75.7	484				448	31.5
Pass	63	49.2	408				767	100	518	830	58.4
Withdraw	16	12.5	396	128	24.3	496				144	10.1
Total	128			527			767			1422	
Spring 1995	**RM Fall 1994**										
Fail	49	43.4	403	509	100	486				558	33.7
Pass	49	43.4	411				837	81.0	519	886	53.5
Withdraw	15	13.3	399				196	19.0	505	211	12.8
Total	113			509			1033			1655	
Spring 1996	**RM Fall 1995**										
Fail	44	35.77%	410.95	478		486.70				522	32.5
Pass	59	47.97%	415.09				828	100	519	887	55.2
Withdraw	20	16.26%	424.00	177		499.60				197	12.3
Total	123			655			828			1606	

Table 4. Comparisons of Student Performance for Math 100-Level Courses Offered in Spring Semesters (continued)

With Remedial CourseWork (RC) Completed in the Immediate Past Fall Semester

	RC Previous Fall			No RC SATM < = 500			No RC SATM > 500			Total	
Term For Math 1xx	Count	%	Average SATM	Count	%	Average SATM	Count	%	Average SATM	Count	%
Spring 1997	**RM Fall 1996**										
Fail	36	37.1	446	460	28.2	496				496	28.8
Pass	45	46.4	442	919	56.5	524				964	55.9
Withdraw	16	16.5	429	248	15.2	507				264	15.3
Total	97			1627						1724	
Spring 1998	**RM Fall 1997**										
Fail	37	30.6	440	399	24.6	495				436	25.0
Pass	56	46.3	440	1037	63.9	524				1093	62.7
Withdraw	28	23.1	441	187	11.5	488				215	12.3
Total	121			1623						1744	

The results provided in Tables 3 and 4 evidence at least four things. First, an SATM average of 500 (530 after recentering) is essential for passing the University's college-level math courses without first taking a remedial math course. Second, if students' SATM are high enough to place them out of remedial math, but below 500/530, they are very likely to fail college-level math in the absence of taking at least one remedial class. Third, if students' SATM are between 400 and 500 (430 and 530 after recentering), they likely can (indeed, they are likely to) be able to pass a college-level math course following completion of at least one remedial math course. Finally, the course tracking results also indicate that for students with SATMs below 400/430, the preparation provided by the University's existing remedial math preparation is insufficient to enable them to pass college-level math courses.

Comparisons of Second-Year Retention Rates

The second measure used to assess the impact of remedial math course was student second-year retention rates. Owing to the fact that not every student who needed remedial education was enrolled in the program upon first matriculating, calculating second-year retention rates for these students became somewhat challenging. For example, for fall, 1992, the remedial program contained students who were first enrolled either in fall, 1992 or more than two semesters earlier. Besides, it was found that not all students taking remedial courses were degree-seeking students. In order to get more accurate assessment of the impact that the remedial math program had on student persistence and graduation rates, only first-time, full-time degree-seeking remedial student retention and graduation rates were used in the following comparisons and analyses.

Table 5 gives the second-year student retention rates by the University's admission type. Table 6 exhibits the second-year retention rates when the same cohort were regrouped according to if they had taken remedial math classes or not.

Table 5. Second-Year Retention Rates For First-time, Full-time, Degree-seeking Student Cohorts

Fall Cohort	Regular Admit	ADP-ACT 101	ADP-Non ACT 101	Special Admit
1992	83.5%	72.2%	82.9%	85.3%
1993	82.9%	76.8%	90.9%	85.6%
1994	78.9%	83.6%	87.9%	82.4%
1995	82.4%	77.2%	80.6%	80.7%
1996	80.5%	81.8%	89.1%	80.1%
1997	82.5%	90.7%	83.1%	81.7%
Multi-Year Average	81.8%	80.4%	85.7%	82.6%

Taking Table 6 for example: In fall, 1992 there were 1,360 students enrolled as first-time, full-time, degree-seeking students. Of them, 188 took a remedial mathematics class at least once, at some point from 1992 to summer 1998. The second-year retention rates for the 1992 cohort were: 82% for non-remedial students and 89.89% for the remediated students. For the 1993 cohort, the rates were 80% for non-remedial course takers and 91% for remediated students! Comparing results in Table 6 with those in Table 5, it becomes obvious that **remedial students tend to have higher second-year retention rates throughout the years than the University's general rates**.

Table 6. Comparisons of Second-Fall Retention Rates Between Remediated and Non-Remediated First-time, Full-time, Degree-seeking Students

	1st Fall Enrolled				
	Non-Remedial		Remedial		Total
Cohort	N	%	N	%	N
1992	1,172	86.18	188	13.82	1,360
1993	1,056	77.31	310	22.69	1,366
1994	1,071	78.98	285	21.02	1,356
1995	1,037	75.42	338	24.58	1,375
1996	1,136	78.51	311	21.49	1,447
1997	1,266	80.59	305	19.41	1,571

	2nd Fall Retention Rates					
	Non-Remedial		Remedial		Total	
Cohort	N	%	N	%	N	%
1992	961	82.00	169	89.89	1,130	83.09
1993	853	80.78	283	91.29	1,136	83.16
1994	845	78.90	237	83.16	1,082	79.79
1995	847	81.68	280	82.84	1,127	81.96
1996	904	79.58	266	85.53	1,170	80.86
1997	1,048	82.78	251	82.30	1,299	82.69

Comparisons of Six-Year Graduation and Retention Rates

The final measure used to assess remedial math program's impact is the six-year retention and graduation rate. Table 7 presents comparisons of the six-year retention rates for students with or without taking remedial coursework. Table 8 displays retention and graduation rates by student admission status upon entering the University. Results provided by both tables were based on the performance of the fall, 1992 freshman cohort.

Table 7 presents that the overall retention rate for non-remediated students was 55.46% and 63.83 for the remediated students. According to Table 8, the six-year general retention rate was 58.33% for the Regular Admit, 55.88% for the Special Admit, 36.11% for ADP Act 101, and 48.78% for ADP Non-Act 101. The general six-year retention rate was 56.62% for the University. Table 7 also shows that according to Consortium for Student Retention Data Exchange (CSRDE), in 1998, the national averages six-year retention and graduation rate was 41.3% for selective institutions and 48.7% for moderately selective institutions. Apparently, not only West Chester University's general six-year retention and graduation rate for fall, 1992 cohort was above the national norm according to CSRDE report (56.62% vs. 48.7%), its remediated first-time degree-seeking students' six-year retention rate was even higher than the University's average.

Table 7. Six-Year Graduation and Retention Rates for Fall 1992 First-Time, Full-Time, Degree-Seeking Student Cohort

Admission Type	Retention	Graduation	Total Ret. & Grad.
Regular Admit	1.71%	56.62%	58.33%
ADP-Act 101	9.72%	26.39%	36.11%
ADP-Non Act 101	2.44%	46.34%	48.78%
Special Admit	2.21%	53.68%	55.88%
University Total	2.21%	54.41%	56.62%
National Average[2] (CSRDE)			
Moderately selective[3]		41.3%	
Selective		48.7%	

Table 8. Summary of Six-Year Retention and Graduation Rates for Students With or Without Taking Remedial Course (Fall 1992 Cohort)

	Non-Remedial		Remedial		Total	
Fall 1992 Cohort	N	%	N	%	N	%
Enrolled in fall 1992	1,172	86.18	188	13.82	1,360	
Enrolled as of Fall 1998	22	1.88	8	4.26	30	2.21
Graduated as of summer 1998	628	53.58	112	59.57	740	54.41
Total	650	55.46	120	63.83	770	56.62

Conclusions & Recommendations

Based on the findings from this study, the following conclusions were drawn concerning the impact of West Chester University's remedial mathematics program:

- Remedial Math seems to help students with moderately low SAT Math scores (400-450) to pass their college-level math courses.
- If a student's SATM is below 500, it is very likely that this student will fail his/her college-level math work unless he/she takes a remedial Math course.
- Even with remedial work, developmental students still tend to have higher course failure rates than their college peers in college-level math coursework.
- In spite of the higher failure rates, remediated students performed at above a C average in their college-level mathematics courses.
- For degree-seeking students, taking a remedial Math course enhances their 2nd-fall retention rate. Degree-seeking remedial students' 2nd-year retention rates are higher than those for the Regular Admits.
- For degree-seeking students, participating in the remedial Math program can help

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[2] Institution size 5,000 - 17,900

[3] Moderately Selective SAT's 900 - 1044; Selective SAT's 1045 - 1100

them accomplishing their goal of obtaining a college-degree. The six-year graduation rate for remedial students in the 1992 fall cohort was higher than that for the University's Regular Admit students.

Our findings and conclusions led to the following recommendations pertaining to the Mathematics remedial courses.

- The Mathematics Department should raise the SATM cutoff score for placement in remedial program.
- The University should reconsider whether students with SATM scores below 400 should be admitted. If they are admitted, the Department of Mathematics should consider a special curriculum for these students.
- The Task Force recommended that steps be taken to educate students, parents, and faculty about the need for remediation and the benefits of remedial Math courses.

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Appendix

Table A. Summary of Students Who Repeated Remedial Courses (RC) in Two Consecutive Semesters

Total Number of Students Enrolled in	Grades in RC Fall 92	N	% of Repeaters*	Total Number of Students Enrolled in	Grades in RC Spring 93	N	% of Repeaters*
Spring 93	Fail	25	43.1	Fall 93	Fail	6	
	Pass	30	51.7		Pass	2	
	Withdraw	3	5.2		Withdraw	0	
99		58	58.6	357		8	2.2
	Grades in RC Fall 93	N	% of Repeaters*		Grades in RC Spring 94		
Spring 94	Fail	27	40.3	Fall 94	Fail	14	
	Pass	38	56.7		Pass	4	
	Withdraw	2	3.0		Withdraw	3	
100	Total	67	67.0	328		21	6.4
	Grades in RC Fall 94	N	% of Repeaters*		Grades in RC Spring 95		
Spring 95	Fail	40	44.9	Fall 95	Fail	14	
	Pass	49	55.1		Pass	10	
	Withdraw				Withdraw	4	
136		89	65.4	363		28	7.7
	Grades in RC Fall 95	N	% of Repeaters*		Grades in RC Spring 96		
Spring 96	Fail	30	40.0	Fall 96	Fail	9	
	Pass	43	57.3		Pass		
	Withdraw	2	2.7		Withdraw	7	
124		75	60.5	297		16	5.4
	Grades in RC Fall 96	N	% of Repeaters*		Grades in RC Spring 97		
Spring 97	Fail	38	63.3	Fall 97	Fail	9	
	Pass	19	31.7		Pass		
	Withdraw	3	5.0		Withdraw	1	
79		60	75.9	313		10	3.2%
	Grades in RC Fall 96	N	% of Repeaters*				
Spring 98	Fail	19	25.3				
	Pass	14	18.7				
	Withdraw	3	4.0				
79		36	45.6				

43.1% = Fail (25) /Total Repeat (58)
51.7% = Pass (30) / Total Repeat (58)
5.2% = Withdraw (3) / Total Repeat (58)
58.6% = Total Repeat (58) / Total Spring 93 (99)

Table B. Summaries of Remedial Course Completion Rates

	Remedial Course Grades					
	Pass		Fail		Withdraw	
Last Zero-Course Term[4]	N	%	N	%	N	%
925	**133**	**86.93**	**13**	**8.50**	**7**	**4.58**
931	59	84.29	9	12.86	2	2.86
933	23	95.83	1	4.17		
934	2	66.67	1	33.33		
935	**203**	**87.12**	**25**	**10.73**	**5**	**2.15**
941	61	84.72	9	12.50	2	2.78
942	2	100.00				
943	24	100.00				
945	**204**	**90.67**	**15**	**6.67**	**6**	**2.67**
951	83	88.30	7	7.45	4	4.26
953	34	97.14	1	2.86		
955	**211**	**82.75**	**30**	**11.76**	**14**	**5.49**
961	84	89.36	8	8.51	2	2.13
962	6	85.71	1	14.29		
963	41	93.18	3	6.82		
965	**157**	**75.12**	**43**	**20.57**	**9**	**4.31**
971	91	81.25	18	16.07	3	2.68
972	9	75.00	2	16.67	1	8.33
973	49	96.08	1	1.96	1	1.96
975	**198**	**72.79**	**62**	**22.79**	**12**	**4.41**
981	43	53.75	31	38.75	6	7.50
982	9	52.94	3	17.65	5	29.41
983	48	73.85	15	23.08	2	3.08
	1774	82.40	298	13.84	81	3.76

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[4] In case a student took the course multiple times, the LAST time the student took the course would be used in the grouping. Only the highest grade that the student earned was included in this profile.

THE ROLE OF THE INSTITUTIONAL RESEARCH OFFICE IN THE INSTITUTIONAL ACCREDITATION SELF-STUDY PROCESS

Marianthi Zikopoulos, Associate Director
Christopher Hourigan, Assistant Director
Office of Planning, Research, and Evaluation
William Paterson University

Introduction

The Office of Institutional Research (OIR) is uniquely poised to assist an institution of higher education in conducting an effective, efficient, and meaningful self-study for reaccreditation. Drawing on the experiences of William Paterson University, the presenters will highlight the steps the Office of Institutional Research can take to help ensure that the self-study process is a successful one.

William Paterson is currently undergoing reaccreditation evaluation by the Middle States Association of Colleges and Schools, our accrediting agency. This evaluation aims to determine whether the University continues to meet the accreditation agency's standards of excellence. In determining whether to accredit or reaccredit an institution, Middle States uses the following criteria:

- The institution must be guided by well-defined and appropriate goals.
- The institution must have established conditions and procedures under which its goals can be realized.
- The institution must be accomplishing its goals substantially.
- The institution must be so organized, staffed, and supported that it can be expected to continue to accomplish its goals.
- The institution must meet the standards of the MS Association's Commission on Higher Education[1] .

This year, William Paterson University is in the first stage of the two-year reaccreditation process. During this phase the University conducts an in-depth self-study and prepares a detailed report. This report will be revised based on input from the University community, in Fall 2000 and will be sent to Middle States in February 2001. In April 2001, a team of evaluators from Middle States will visit the University for an on-site reaccreditation review.

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[1] Middle States Association of Colleges and Schools, Commission on Higher Education. (1994). Characteristics of Excellence in Higher Education: Standards for Accreditation [WWW Document] URL http://www.msache.org/charexcl.html (visited 1999, June 8), p.1

The Self-Study Process

Conducting a self-study in preparation for reaccreditation by Middle States generally involves writing a document that addresses structural and organizational aspects of an institution, including curriculum, finance, governance, faculty, students, etc. A steering committee, representing a wide range of constituencies within the university, usually leads the effort. A number of subcommittees are formed and each is assigned to conduct a thorough evaluation of one aspect of the institution and write a report. Each subcommittee will need data to carry out its charge effectively. The role of the OIR is to make the needed data available in the most timely and efficient manner and to assist subcommittees in addressing the data needs that arise during the self-study process.

Role of the Office of Institutional Research (OIR) at stages of the self-study process

A. Prior to Self-Study

- It is important that the data cited in the Self-Study Report be official and consistent. Because of its familiarity with the structure of an institution's data, the speed with which the data can be generated, and the general complexities associated with the data, the OIR is best able to collect and maintain accurate data and serve as a reliable source of institutional data for internal and external purposes.

- Every institution needs to keep some basic data on an ongoing basis. These include information on admissions and enrollment information, retention and graduation, student satisfaction, etc. Additionally, Middle States great deal of emphasis on outcomes assessment. Institutions must examine whether they have sufficient outcomes assessment data and, if not, take steps to acquire them.

- Don't wait until the self-study begins to start conducting assessment studies. Assessment and evaluation should be done on an ongoing basis. When developing assessment instruments, keep in mind the agency's accreditation criteria listed above, and, to the extent possible, address these criteria directly. In this manner, you can demonstrate to the accreditation agency that you are involved in an ongoing self-evaluation, which is viewed positively.

- Start preparing early--Reaccreditation is a two-and-a-half year process, as the following timetable of our self-study shows[2]:

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[2] "Design for the Self-Study Process in Connection with the Reaccreditation of The William Paterson University of New Jersey by The Middle States Association of Colleges and Schools." (1999, 27 May), p.44

Self-Study Timetable, William Paterson University

February 1999

- Develop initial outline of self-study design
- Day-long retreat to introduce steering committee to self-study process, discuss institutional issues, review and discuss initial outline of self-study design, identify possible subcommittees and charges.

March 1999

- Develop draft of Self-Study Design document, including proposed subcommittees and charges
- Half-day retreat of steering committee to get feedback on Draft Self-Study Design

April 1999

- Revise Self-Study Design
- Mail preliminary packet of information to CHE staff member in preparation for visit.
- April 15, visit to campus by CHE staff member

May 1999

- Finalize Self-Study Design document and submit to CHE
- Finalize sub-committee membership and convene subcommittee chairs to review charges

Summer 1999

- Assemble resource documents and create resource room for use by subcommittees

Academic Year 1999-2000

- Subcommittees carry out charges and prepare draft reports (September-January)
- Review and revise subcommittee reports (February-March)
- Assemble and edit subcommittee reports to yield first draft of full report (April-May)
- Review and provide feedback on first draft of full report (May-June)
- Prepare and print second draft of full report (July-August)

Academic Year 2000-2001

- Distribute draft report and provide opportunities for discussion and campus feedback (September-November)
- Do final editing of report (December-January)
- Mail report to visiting team (February)
- Campus visit by Middle States team (April)

Once a model and approach have been chosen, try to determine which of the currently available data are relevant to the self-study and what additional data must be collected. Starting early gives your office sufficient time to conduct surveys, special analyses, etc. and have data ready when they are needed by the subcommittees. It also gives your office time to evaluate whether you have the required resources to carry out the data gathering required for the self-study and make a case for additional resources if needed.

B. Planning Stages of Self-Study --Working with Steering Committee

It is very important that OIR staff know the data requirements of the subcommittees early on in the process in order to be able to provide the needed support. OIR representation on the steering committee and participation in the planning meetings is an optimal way of accomplishing this. Where direct representation is not possible, it is important that the OIR be in close communication with the steering committee chair or have easy access to committee charges in some other manner.

- To ensure that subcommittees have the data they need most efficiently, it is important that the steering committee establish rules and procedures for data gathering and dissemination. As the experts in this area, the OIR can assist the steering committee set up rules that will make the data dissemination process run smoothly. The following rules seemed to work best for our institution: a) The OIR is primarily responsible for meeting the data needs of the subcommittees; b) the OIR works with subcommittees to ensure that all information used is reliable and accurate; c) all subcommittee members have easy access to basic institutional data.

- Once charges have been written, it is important that OIR have access to them immediately in order to determine the subcommittees' data needs. By knowing what the charges are early in the process, OIR can begin assessing the availability of the needed data and start collecting unavailable data before the subcommittees start their work.

C. During self-study

- *Assess which of the available data may be useful to each subcommittee in order to carry out its charge and prepare customized lists of resources:* The OIR can help subcommittees by preparing for each a customized list of data resources that are relevant to that committee's area of investigation. At William Paterson, our office created annotated lists of resources for each subcommittee that include the data resources most relevant to each group and explaining how each resource might be helpful to the subcommittee's charge. We then created a binder containing all group-specific resource lists, as well as information as to where the actual documents are located, which was distributed to all subcommittee members.

- *Make resources easily accessible:* In order for subcommittees to prepare their reports in a timely manner, they must have easy access to the data resources. The OIR can make this possible by collecting all existing documents, organizing them and placing them in a resource room. The resource room must be in a location to which all subcommittee members have easy access. At William Paterson, our resource room is located the library. The documents are arranged by general subject (i.e. Assessment, Faculty, Admissions etc.), rather than subcommittee, so that the subcommittees have access to all available resources and are not limited only to those items that appear on their individual list. Web technology is another potential vehicle for making certain resources readily accessible to subcommittees.

- *Serve as a Clearinghouse:* When subcommittees begin their work, inevitably many questions arise regarding data availability. Since the OIR possesses expertise in this area, it is advisable that it serve as the data clearinghouse, with all data requests going through it. Subcommittees will invariably need information beyond what is available in the resource library. Establishing the Institutional Research Office as the clearinghouse avoids duplication of effort, guarantees that any additional information is gathered in an efficient and effective manner, and ensures that all data used in the self-study are reliable. Beyond providing data, OIR should try to build relationships with the subcommittees to help them understand the data that they will ultimately include in their self-study.

- *Check accuracy of data in report before it goes to MS*

D. After Self-Study is Completed

- If data gaps still exist at the conclusion of the self-study, the one-year time period until the accreditation team visits the campus can be used to fill in some of those gaps. The OIR can collect or develop a plan for collecting the needed data during that period and add them to the resource library to be available to the visiting team. Acknowledging in the self-study report that a problem exists; presenting a proposal of how the institution plans to address the problem; and beginning to take action in the time before the team visits are viewed positively by Middle States. These steps indicate that the institution conducted a truly thorough self-examination and used this process constructively to improve areas that did not meet the standards.

References

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NEAIR 26th Annual Conference

Saturday, November 13, 1999	
1:00 – 5:00 p.m. *East Foyer - Registration desk*	**Conference Registration**
2:00 – 5:00 p.m. *Columbia* Karen Bauer Assistant Director of Institutional Research and Planning University of Delaware NEAIR President	**Newcomers to Institutional Research, Part 1** This workshop is designed for new practitioners who engage in IR activities. This workshop addresses key components of IR including defining critical issues for institutional research, identifying sources of data, developing fact books and other reports, and conducting effective survey research for assessment and evaluation. The main focus is a presentation of general concepts and practical strategies for the implementation of continued development of effective IR at many schools, regardless of size or type. Workshop
2:00 – 5:00 p.m. *Enterprise* Mary Ann Coughlin Professor of Research & Statistics Springfield College	**Statistics for Institutional Research** Basic ideas in statistics will be covered in a way that is useful as an introduction or as a refresher to statistics. Descriptive statistics, sampling and probability theory as well as the inferential methods of chi-square, t-test and Pearson's r will be covered. May be taken with or without the follow-up advanced workshop. Workshop
2:00 – 5:00 p.m. *Freedom* Heather M. Jasmin Information Technologist II Keene State College	**Designing Professional Presentations Using Microsoft Power Point** This workshop is designed for the institutional research professional who would like to learn how to design effective computerized presentations. This introductory session using Power Point for Office97 will include everything the participant needs to start creating great presentations, including animation, graphics, presenter's notes, handouts, and saving as HTML. Workshop
6:00 – 7:00 p.m. *Atrium*	**Newcomers' Reception**

NEAIR 26th Annual Conference

Sunday, November 14, 1999

8:00 a.m. – 4:30 p.m. *East Foyer - Registration desk*	**Conference Registration**
9:00 a.m. – noon *Columbia* Karen Bauer Assistant Director of Institutional Research and Planning University of Delaware NEAIR President	**Newcomers to Institutional Research, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
9:00 a.m. – noon *Enterprise* Robert Toutkoushian Executive Director Office of Policy Analysis University System of New Hampshire	**Regression Analysis & Logistic Regression: Theory & Application** This workshop will provide an overview of the theory behind regression analysis and logistic regression. It will provide a demonstration of how these tools can be applied to a variety of IR issues such as faculty salaries, student retention, and educational costs. SPSS will be used in this workshop, and students will receive handouts and a disk with sample datasets used in the workshop. Workshop
9:00 a.m. – noon *Freedom* Jerry Werner President Werner Consulting, LLC Madison, Connecticut	**Meeting Customer Needs For Reporting and Analysis** How to Use the Werner Wheel and Other Quality Tools in Institutional Research. A half-day workshop on the application of quality methods to meeting customer needs for analysis and reporting. Workshop
9:00 a.m. – noon *Salve Regina University PC Lab* **Transportation will be provided for registrants* Mary Ann Coughlin Professor of Research & Statistics Springfield College	**Advanced Statistics for Institutional Research** This workshop will deal with advanced issues in inferential statistics. Topics such as Analysis of Variance, Factor Analysis, Multivariate Regression, and Logit/Probit models will be covered and contrasted with other statistical tools and techniques. A case study approach will be used illustrating applications of these statistical techniques in institutional research. **Open to those who have completed the introductory workshop Saturday afternoon or who have an equivalent background.* Workshop
Noon – 1:30 p.m.	**Lunch break (On your own)**

NEAIR 26th Annual Conference

Sunday, November 14, 1999 continued	
1:30 – 4:30 p.m. *Columbia* Anne Marie Delaney Director of Institutional Research Babson College	**Research Design Ideas for Institutional Researchers** The goal of this workshop is to enhance institutional researcher's ability to translate data into information and to transform reporting into research. Objectives include enabling participants to prepare methodologically sound research reports for their institutions and research proposals for professional conferences. The workshop will demonstrate how the institutional researcher can use principles of research design and selected research techniques to transform data collection activities into meaningful research projects. Ideas for the workshop will be based on research projects completed by the presenter as well as on actual or proposed studies of interest to the participants. Workshop
1:30 – 4:30 p.m. *Enterprise* Robert Toutkoushian Executive Director Office of Policy Analysis University System of New Hampshire	**Regression Analysis & Logistic Regression: Theory & Application** Continuation of morning session. Workshop
1:30 – 4:30 p.m. *Middletown* Craig Clagett Vice President for Planning Marketing and Assessment Carroll Community College	**Office Management and Information Dissemination Strategies for New Directors of Institutional Research** Designed for institutional researchers, who have recently become directors, this workshop focuses on office management strategies and techniques for effective information dissemination. Topics covered include environmental scanning, office staffing, staff incentive and recognition programs, office project management systems, principles of tabular and graphical data presentation, print and electronic reporting, and office websites. Workshop
5:00 – 6:15 p.m. *Salon I* **Claire L. Gaudiani** **President of Connecticut College**	**President & Planner: Two Important Tasks** Is it possible for college presidents to pursue the broad-based work of their institutions and still give significant personal leadership to the challenges of economic development and social justice in their cities and the surrounding areas? Dr. Gaudiani will share her thoughts on how institutional researchers can assist college presidents in building a collaborative relationship with community leaders, enabling presidents and other college officials to share how the college and university experience benefits all. **Opening Plenary Session**
6:30 – 8:30 p.m. *Salons II, III & IV*	**Banquet and Entertainment** Traditional New England Clambake (Vegetarian option) Music provided by a local jazz quartet Cash Bar

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Monday, November 15, 1999	
8:00 – 11:00 a.m. *East Foyer - Registration desk*	**Conference Registration**
7:15 – 8:45 a.m. *Salons III & IV*	**Continental Breakfast & Concurrent Table Topics**
Tara Latawic Research Analyst University of Connecticut *Table 1*	**Web Based Data Sources for Institutional Researchers** A discussion of web sites and data sources that contain information useful for Institutional Researchers. Topics will include search engines and ways to make searches more efficient.
Marsha V. Krotseng AIR President Associate Provost Cleveland State University *Table 2*	**Continuing the Strategic Planning Momentum** The session will focus on the strategic planning process used at one Doctoral II University over the past five years. The institution's plan goals and priorities will be described together with the approach for updating the goals and priorities annually and monitoring progress. Copies of these documents will be distributed.
Victor Berutti Vice President, Products Principia Products, Inc. *Table 3*	**Designing forms for Remark Office OMR** Principia personnel will be on hand to discuss form design considerations and to answer questions from Remark users and those interested in the product. Participants are encouraged to bring copies of their forms for discussion with the group.
Linda Jünker Mount St. Mary Catholic *Table 4*	**Catholic Colleges & Universities SIG**
Kathleen Kern Bowman Consortium on Financing Higher Education *Newport*	**COFHE** COFHE members are invited to share questions and comments
8:00 – 8:50 a.m. *Columbia* Dr. Penny A. Blackwood Association of Independent Colleges & Universities of Pennsylvania	**The Development and Analysis of a Freshman Experience Survey for Pennsylvania's Independent Colleges and Universities** The development of a freshman experience survey is described. Results of generalizability analyses and conducted on field-test data to assess how well the survey differentiated individuals and institutions are also presented. The workshare should interest users and developers of freshman and other surveys and those interested from a methodological standpoint. Workshare

Monday, November 15, 1999 continued

8:00 – 8:50 a.m. *Courageous* William S. Stuart Assistant to the Director Planning and Institutional Research Eastern Connecticut State University Moderator: Richard Heck	**Factors in Early College Academic Performance: Does Race Matter?** This research investigates whether race matters in the early academic performance of college students. Regression analysis is used to determine whether controlling socioeconomic status, prior academic performance, standardized test scores, demographic characteristics, and certain enrollment characteristics eliminates the differential between African-American and White academic performance. **Paper**
8:00 – 8:50 a.m. *Enterprise* Karen Spahn Executive Director, Institutional Research University of Phoenix	**Assessing the Online Campus** Since 1989, the University of Phoenix has been assessing and training faculty to provide quality academic programs for adult students who could not participate in an on-ground class as well as all online adult students' cognitive, affective, critical thinking and communication skills. In 1989, the University began providing full-time working adults the opportunity to complete an undergraduate and/or graduate degree solely through an online environment. Unlike in many computer mediated courses/academic programs across the country, assessments are intricately woven from beginning to end into all online academic programs. This presentation will provide information on the assessment process utilized to hire prospective faculty, the training and mentorship provided and the on-going assessment of teaching effectiveness as well as, adult students' academic achievement outcomes, how the outcomes of online programs differ from on-ground programs and how the outcomes are used to update and keep rigorous and up to date all online academic programs. Workshare
8:00 – 8:50 a.m. *Freedom* Cathy Trower Senior Researcher Harvard University	**Faculty Appointments: Using Data Strategically** Two new resources designed to help institutional researchers and policy-makers address questions about faculty appointments and resolve dilemmas about what's normative and what's innovative will be demonstrated: 1) a key-word searchable CD-ROM containing the faculty handbooks of 250 four-year institutions; 2) a set of templates that help institutions track faculty from entry to exit. Workshare

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Monday, November 15, 1999 continued	
8:15 – 9:45 a.m. *Middletown* Barbara B. Livieratos Assistant Director Office of Planning & Evaluation Howard Community College Bob Lynch Community College of Baltimore Arlene Blaylock Montgomery College Janis Battaglini Anne Arundel Community College Michele Appel Carroll Community College Hershel Alexander Charles Community College Moderator: Rena Cheskis-Gold	**The Common Core: One State's Approach to Getting Comparative Data From Student Satisfaction Surveys** This panel presentation will illustrate how the Maryland Community College Research Group (MCCRG) collaborated to use a common set of items on surveys of currently enrolled students and to benchmark satisfaction data against external institutions. Panelists from six colleges will discuss the collaborative effort, including different processes of survey administration, and will present some comparative findings. Panel
8:00 – 8:50 *Weatherly* Claire Powers Research Analyst Office of Institutional Research Ithaca College	**Web Surveys: The Ithaca College Experience (So Far)** In light of declining response rates, IR offices must explore use of the Web to distribute questionnaires to students and alumni. This presentation summarizes our first attempts to increase response, as well as the efficiency with which data are gathered and analyzed, by posting two surveys on the Web. Workshare
9:00 – 9:50 a.m. *Columbia* Meihua Zhai Assistant Director, Office of Research and Planning West Chester University Jennie Skerl Associate Dean College of Arts and Sciences West Chester University Moderator: Kelli Armstrong	**The Impact of Remedial Mathematics Courses on Student College Level Math Performance and Their Persistence** The impact of remedial math class on student persistence and performance in their college-level math was studied. Retention rates and percentages of students who passed their college-level math were compared between remedial and non-remedial course takers whose SATM were below 450 (480 after recentering). Paper

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Monday, November 15, 1999 continued

9:00 – 9:50 a.m. *Courageous* J. Fredericks Volkwein Director and Professor Center for the Study of Higher Education The Pennsylvania State University Jeff Gerken Assistant for Institutional Research SUNY Albany Moderator: Gail Wisen	**Pre-College Characteristics and Freshman Year Experiences as Predictors of 8-year Outcomes** This investigation examines twelve educational outcomes for a representative group of undergraduate students who began their freshman year in Fall 1990. Looking at these students in 1998, the study explores the association among pre-college characteristics, freshman year experiences, freshman year outcomes, and their cumulative 8-year college history. Results indicate that freshman college experiences are better predictors of all twelve outcomes than are the pre-college characteristics. Classroom experiences, faculty relations, and peer relations are the most influential predictors of subsequent outcomes. Paper
9:00 – 9:50 a.m. *Enterprise* Michelle Appel, Coordinator of Institutional Research Carroll Community College Craig Clagett Vice President for Planning, Marketing and Assessment Carroll Community College Moderator: J. Fredericks Volkwein	**Where Do I Start? Determining Institutional Information Needs Beyond Mandated Reporting** An information needs assessment can introduce the IR function to an institution, communicate responsiveness to institutional needs, and collect data for task prioritization. This presentation will discuss Carroll Community College's development, administration and results of an information needs assessment and its use in planning and potentially expanding the IR area. Paper
9:00 – 9:50 a.m. *Freedom* Stephen Cunningham Director, Strategic Planning & Research Pennsylvania College of Technology Moderator: Mark Palladino	**What's in a name change? Using CIRP Data At a Transitional Two-Year College** This study examines five years of CIRP freshman survey data over a ten-year period following the merger of a community college with a major public research university. Changes in the characteristics of entering classes and comparisons to national freshman norms are expected. Paper
9:00 – 9:50 a.m. *Weatherly* Marc Assiff Sales Representative National Computer Systems (NCES)	**NCS Paperless Solutions** NCS, the leader in paper-based data capture, now leverages the Internet to provide a total electronic solution through HTML, e-mail questionnaires and surveys. Vendor Showcase
9:50 – 10:15 a.m. *Freedom Foyer*	**Break**

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Monday, November 15, 1999 continued

10:15 – 11:50 a.m. *Columbia* Dr. David Cheng Assistant Dean Research and Planning Columbia University Dr. Eleanor Fujita Director, Academic Information, Academic Affairs Central Office, The City University of New York Dr. David Crook Acting Dean, Institutional Research and Analysis Central Office, The City University of New York Moderator: Peggye Cohen	**The Remediation Debate: The National Context and CUNY Experience** In the last decade, as demands for accountability have grown, the appropriateness of providing remedial instruction in colleges has increasingly come into question. This panel discusses current policies identified through a national survey and local concerns highlighted in a major task force report which scrutinized The City University of New York. Panel
10:15 – 11:00 a.m. *Courageous* Diane J. Goldsmith Director of Assessment for Online Learning Charter Oak State College Moderator: Robert Toutkousian	**Online Courses: Who's Taking Them, Why, and Are They Successful?** This study analyzes the demographics of 117 students who participated in 19 online courses in seven colleges in the spring 1999 semester. It also examines why students take online courses and what factors in course design contribute to student satisfaction and in their meeting the course objectives. Paper
10:15 – 11:00 a.m. *Enterprise* Craig A. Clagett Vice President for Planning, Marketing and Assessment Carroll Community College Michelle S. Appel, Coordinator Institutional Research Carroll Community College Moderator: Robert Yanckello	**A Comprehensive Marketing Research Program for Commuter Colleges** Six elements of a comprehensive marketing research program will be described and evaluated: secondary research and market analysis, telephone survey of adult residents of the college's service area, classroom survey of current students, focus groups with high school students, brainstorming with long-time staff, and solicitation of marketing ideas from the college community. Paper

Monday, November 15, 1999 continued	
10:15 – 11:00 a.m. *Freedom* William S. Stuart Assistant to Director Planning & Institutional Research Eastern Connecticut State University David A. Hemenway, Director Planning & Institutional Research Eastern Connecticut State University	**Improving Institutional Effectiveness Through Information Infrastructure and a Quality Management Approach** This workshare demonstrates how a well-developed information infrastructure and a quality-management approach can improve institutional effectiveness. Anyone working to improve institutional effectiveness, especially in the administrative side, should attend. Workshare
10:15 – 11:00 a.m. *Middletown* Heather A. Kelly Institutional Research Analyst Institutional Research & Planning University of Delaware	**The Development of a Web-Based Survey: Survey Design to Data Analysis** The development and use of web-based surveys in institutional research has been increasing. This workshare will demonstrate the development of a web-based survey from initial design to data analysis. The development of this particular web-based survey did not utilize a software package. A discussion will follow the demonstration focusing on the benefits as well as the obstacles that were overcome during the survey development and administration processes. Workshare
10:15 – 11:00 a.m. *Weatherly* James Vallee, Consultant Postsecondary Assessment ACT, Inc.	**ACT: A Database for Advising/Retention and Outcomes Measures** This session will present an overview of the ACT assessment products that produce a comprehensive database for use in advising/retention, outcome assessment and general research. Vendor Showcase
11:05 – 11:50 a.m. *Courageous* Dr. Kenneth R. Ostberg Director of Marketing National Student Loan Clearinghouse	**Using Enrollment Search to Track Student Migratory Patterns** The National Student Loan Clearinghouse maintains a unit record database containing current enrollment information on nearly 11 million college students. The database is available to support various institutional research needs. Vendor Showcase

Monday, November 15, 1999 continued	
11:05 – 11:50 a.m. *Enterprise* Yuko Mulugetta Director of Research and Planning Analysis for Admissions and Financial Aid Cornell University Abraham Mulugetta Professor of Finance and International Business, and Director of the Center for Trading and Analysis of Financial Instruments School of Business at Ithaca College	**What Prevents the Development of Distance Learning in the Higher Education Market?** By conducting multivariate analysis on the National Distance Education Survey data, the present study investigates the extent to which certain kinds of factors may be preventing institutions from fully developing distance education programs. Paper
11:05 – 11:50 a.m. *Freedom* Victor Berutti Vice President, Products Principia Products, Inc.	**Principia Products, Inc. – Remark Software Demonstration** Principia will discuss tools that IR professionals may utilize to more quickly and inexpensively capture data for their research studies. The Remark Office OMR, Remark Web Survey, and Remark Classic OMR software will be demonstrated during this session. These products are widely used in IR departments to capture data from both paper and web-based surveys. Vendor Showcase
11:05 – 11:50 a.m. *Middletown* Yun K. Kim, Officer Planning, Research & Grants Management Charles County Community College	**Charting the Future With Strategic Planning** Strategic planning is used to ensure that the college belongs in the future and prospers in that new environment. Strategic planning coupled with the Balanced Scorecard is serving as a bridge between the old and new paradigm. This session is for individuals who lead or support strategic planning. Workshare
11:05 – 11:50 a.m. *Weatherly* Arthur Kramer Director, Institutional Research New Jersey City University Ansley W. La Mar Dean of Arts of Sciences New Jersey City University Moderator: Alan Sturtz	**Evaluation of the General Studies Program at a Public Urban University: What Worked and What Did Not** The social, political and institutional pressures at an urban public university resulted in the need for a multi-method design to analyze student knowledge and abilities, effectiveness of enrollment policies and practices, and student and faculty satisfaction with the general studies curriculum. Results and the revised curriculum will be presented. Paper

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Monday, November 15, 1999 continued

Noon – 1:25 p.m. *Salons III & IV*	**Luncheon and Business Meeting**
1:35 – 2:20 p.m. *Columbia* Rena Cheskis-Gold, Consultant Demographic Perspectives	**Effective Tables and Charts: Graphic Presentation for Institutional Research** Conveying quantitative information, both simple and complex, is the hallmark of institutional research. Charts and tables must be clean, clear and have a professional appearance. What are some examples of good charts and tables, and what are some examples of bad ones? Bring the best and the worst, and learn some design principles for additional guidance. Workshare
1:35 – 3:10 p.m. *Courageous* Patricia M. O'Brien, Director Institutional Research and Assessment Bridgewater State College Adrian Tinsley, President Bridgewater State College Kelli Armstrong, Director Institutional Research UMass President's Office Moderator: Jennifer Brown	**Three Perspectives On the Development of a Performance Measurement System For the Massachusetts State Colleges: Or, How We Build the Bridge On the River Kwai** In 1998, the Massachusetts legislature mandated the development of a performance measurement system to certify state colleges' achievement of nine accountability goals. This session describes the development of the performance measurement system from three perspectives: a state college president, a Board of Higher Education staff person, and a campus institutional researcher. Panel
1:35 – 2:20 p.m. *Enterprise* Michael K. Schuchert Director of Institutional Research Montgomery County Community College Moderator: Karen Spahn	**Implications of Age on Computer-Based Remedial Education** This study examines the role of students' age in computer-based remedial education. Dependent variables for the study include course completion rates and students' course performance. The results have direct implications for the recruitment and screening of students with higher probability for success in courses with limited availability. Paper
1:35 – 2:20 p.m. *Freedom* Robert K. Toutkoushian Executive Director Office of Policy Analysis University System of New Hampshire Moderator: Heather Kelly	**Do Institutional Characteristics Affect Student Gains?** This study uses data from the Higher Education Research Institute to determine whether institutional characteristics such as expenditures, selectivity, and priorities influence the self-reported gains of a national sample of undergraduates. While a number of significant predictors are identified, little evidence is found that institutional characteristics matter. Paper

NEAIR 26th Annual Conference

Monday, November 15, 1999 continued

1:35 – 2:20 p.m. *Middletown* Marianthi Zikopoulos Planning, Research and Evaluation William Paterson University Christopher Hourigan Planning, Research and Evaluation William Paterson University	**The Role of the IR Office in Institutional Accreditation Self-Study Process** The Middle States Accreditation process provides a unique opportunity for an institution to position itself for the next millennium. By undertaking the required in-depth assessment of its effectiveness during the self-study stage, the institution can gauge what changes are needed, if any, to be effective in an increasingly global economy and technological world. The Office of Institutional Research plays a major role in the institution's ability to conduct an effective accreditation self-study. Drawing on the experience of William Paterson University, which is undergoing Middle States Reaccredidation, the presenters will discuss the many ways in which the IR office can contribute to an effective and efficient self-study. Workshare
1:35 – 2:20 p.m. *Weatherly* Jerry Wilcox, Director Institutional Research and Assessment Western Connecticut State University	**Quick Student Retention Summaries and Projections** Armed with a properly crafted student tracking database and some rudimentary knowledge of SQL (structured query language) and FoxPro statements, one can rapidly generate retention analyses for any sub-population. In turn, one can import these results into spreadsheet models to generate cohort-based projections of enrollment, course demand and housing demand. Workshare
2:25 – 3:10 p.m. *Columbia* Keith J. Guerin, Director Institutional Research & Planning County College of Morris Moderator: Mary Ann Coughlin	**Tracking the Casual Chain of Student Choice: An Event History Approach to Studying Student Persistence** Previous research on persistence has emphasized the role of characteristics and external factors that effect retention. This study examines a series of behaviors that may reflect a chain of incremental decision-making. More specifically, dropping courses, changing majors and reducing course loads are examined as time-varying predictors of student exit. Paper

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Monday, November 15, 1999 continued	
2:25 – 3:10 p.m. *Enterprise* Anne Marie Delaney Director of Institutional Research Babson College Moderator: Pam Roelfs	**Institutional Researchers as Leaders in Policy: Perspective and Possibilities** This paper presents the results of a completed research study that investigated the leadership role of 304 members of the Northeast Association of Institutional Research. Results reveal that while 85 percent disseminate their work at the vice presidential and presidential levels, only 47 percent report that their work has effected program policy changes. Those in higher level positions experience a greater role in policy, job rewards and support for leadership role. Compared with females, a higher percent of males collaborate with others in program development, present work at executive level meetings, and have the authority to set their own research agenda. Paper
2:25 – 3:10 p.m. *Freedom* Dan McConochie, Director Planning and Evaluation Howard Community College Jean Frank Senior Research Analyst Howard Community College Moderator: Arthur Kramer	**Baldridge Criteria & Institutional Research** In an effort to better understand the Malcolm Baldridge criteria, the Planning and Evaluation Office at Howard Community College has piloted an application process by participating in the Pacesetter self-assessment of one of the department's major functions. The paper will share what we have learned about Baldridge criteria, the modified application process used in this pilot, and the results of our application process, including how the information we gathered will be used to improve the college's reporting process. Paper
2:25 – 3:10 p.m. *Middletown* Gurvinder K. Khaneja Research Associate Union County College Amarjit Kaur Academic Technology Consultant Union County College Moderator: Louis Cohen	**Electronic Fact Book: A Reality of Today** The insurgence in the infrastructure of the information due to the Web has resolved that the fundamental particle in information transfer is no more an "atom" but a "bit." The IR office at Union County College envisioned its effective usage and initiated its presence on the web with an on-line "Fact Book." This paper presents in-depth information on the advantages, construction and issues related to the on-line Fact Book. Paper
2:25 – 3:10 p.m. *Weatherly* Michael J. Dooris, Director Planning Research and Assessment Penn State University Daniel P. Nugent Management Information Associate Penn State University	**Targeted Research to Support Planning and Improvement** This session will illustrate a few tools that Penn State has recently chosen to develop as targeted support for the University's strategic planning and CQI programs. Participants will receive copies of the University's 1999 strategic indicators report; we will also discuss our Web-based "planers' almanac," and several products relating to faculty workload and development. Workshare

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Monday, November 15, 1999 continued	
3:10 – 3:40 p.m. *Freedom Foyer*	**Break**
3:40 – 4:25 p.m. *Columbia* Stephen Porter Research Analyst Office of Institutional Studies University of Maryland Moderator: Meihua Zhai	**Including Transfer-Out Behavior Models: Using the NSLC Enrollment Search Data** The National Student Loan Clearinghouse has created a new database that tracks students across institutions. This paper investigates one-and two-year retention at the University of Maryland using the data to create a six-outcome dependent variable: retained, transferred to an in-state/out-of-state 2 year/4-year institution, or stopped out. Paper
3:40 – 4:25 p.m. *Courageous* Stephen W. Thorpe Director of Institutional Research Drexel University Moderator: Denise Krallman	**The Mission of Institutional Research** Mission statements are a useful vehicle to communicate the purposes, goals, and objectives for functional units within organizations. To describe institutional research in higher education, a content analysis was performed on mission statements of IR offices within NEAIR. This paper presents the findings of the study. Paper
3:40 – 5:15 p.m. *Enterprise* Terrence Russell Executive Director Association for Institutional Research Florida State University Marsha Krotseng AIR President Associate Provost Cleveland State University Moderator: James Trainer	**Town meeting on National Data Policy: The New IPEDS: Changes Coming in 2000** The 2000 IPEDS data collection will extend web-based procedures to the entire set of surveys. Changes in data elements, some Congressionally mandated, will also begin to be implemented. The new structure and timing of the IPEDS process will be discussed, as well as other changes that are planned for the future. Panel
3:40 – 4:25 p.m. *Freedom* Ernest Price Northeast Regional Sales Manager Educational Testing Service Kathy Pruner, Higher Education Assessment Representative Educational Testing Service	**Using Assessment to Drive Change** ETS helps promote institutional effectiveness by providing the tools needed to measure educational outcomes. Through its Higher Education Assessment Program, ETS offers an array of tests and surveys used widely in outcomes assessment. These range from those that measure individual skills and content mastery to those that measure overall institutional effectiveness. Vendor Showcase

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Monday, November 15, 1999 continued

3:40 – 4:25 p.m. *Middletown* Mark A. Palladino Research Specialist Drexel University	**Using the Internet & Your Campus IT Resources to Conduct Web-Based Surveys** The Internet is fast becoming a popular method for survey data collection. For IR, having a population that, in most cases, has 100% access to email and the web, conducting web-based surveys may be a more effective method for data collection when compared to the old-fashioned paper method. This workshare will provide an overview of the process of creating web-based surveys, from start to finish, and discuss issues that may arise during the process. Workshare
3:40 – 4:25 p.m. *Weatherly* Gail Wisan, Director Institutional Planning and Research University of Maryland University College DeAnn Buss, Assistant Director Institutional Planning and Research University of Maryland University College	**UMUC and the Distance Demonstration Project: Data Collection, Evaluation, and Prospects for the New Millenium** This workshare will describe the required data elements and demonstrate the U.S. Department of Education's Data collection format. Some preliminary data and analyses comparing distance and on-site students at UMUC will be presented. Methodological and theoretical issues will be discussed. Workshare
4:30 – 5:15 p.m. *Columbia* William S. Stuart Assistant to the Director Planning and Institutional Research Eastern Connecticut State University James J. Hughes Eastern Connecticut State University Moderator: Yun Kim	**Who Talks to Whom on Campus: Using a Survey of Staff Satisfaction With the Service of University Offices to Describe the Structure of Administration** This study analyzes the administrative structure of a university using a survey of staff satisfaction with university offices. Contact patterns and satisfaction rates from the survey are analyzed by staff type, and natural groupings of offices are generated using factor analysis. Qualitative research explores the reasons for the natural groupings. Paper
4:30 – 5:15 p.m. *Freedom* Suzanne Johnson Institutional Research Monroe Community College	**The Effect of Expectations vs. Experience on Retention** Unrealistic expectations of incoming freshmen and transfer students are related to retention. On 16 of 34 survey items, student experience at MCC differed significantly from their pre-enrollment expectations by 10 to 41 percentage points. The following semester, returning and non-returning students differed significantly on several of these items. Workshare

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Monday, November 15, 1999 continued	
4:30 – 5:15 p.m. *Middletown* Qing Lin Mack Director of Institutional Research Asnuntuck Community-Technical College Moderator: Tara Maher	**What Should We Do to Capture the Increasing Numbers of High School Graduates?** At Asnuntuck Community-Technical College, our enrollment decreased last year after increasing in the number of graduates from high schools in Connecticut. This paper will compare the actual number of area high school graduates and the high school graduation projection data, to the current Asnuntuck enrollment data to project the potential future enrollment of high school graduates at this small liberal arts community college and to make policy recommendations to the college President and other policy makers. Methodological and data access issues will be discussed for those interested in doing similar studies at their colleges/universities. Paper
4:30 – 5:15 p.m. *Weatherly* Christine Brooks Cote, Director Institutional Research and Registrar Bowdoin College	**The Role of Institutional Research in a Curriculum Review: Moving Faculty from Broad Questions to Recommendations for Change** Two years ago, the Bowdoin College faculty began a review of the curriculum. In preparation, transcripts of three graduating classes were analyzed to determine how students navigated and actually experienced the curriculum then in place. Recommendations for curricular change have now been proposed and many can be linked to the results of the analysis. Workshare
5:30 – 6:30 p.m. Atrium	**President's Reception**

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Tuesday, November 16, 1999

8:00 – 11:00 a.m. *East Foyer - Registration desk*	**Conference Registration**
7:15 – 8:45 a.m. *Salons III & IV*	**Continental Breakfast & Concurrent Table Topics**
Yuko Mulugetta Director of Research & Planning Analysis for Admission & Financial Aid Cornell University *Table 1*	**AID-Research-NET-L** The AID-Research-NET-L has become a vital communication vehicle in student financial aid research community. This session will discuss the best use of the AID-Research-NET-L in order to improve collaboration and cooperation between IR and AID offices.
Pam Roelfs Director, Office of Institutional Research University of Connecticut *Table 2*	**Student Feedback on Computing Services & Information Technology** Using one institution's recent survey as a starting point, discussion will focus on experiences, issues and suggestions on the role student feedback can play in assessing and changing computing services.
Kandice Salomone Assistant Director, Office of Strategic Planning & Institutional Research University of Rhode Island *Table 3*	**People Soft Users** NEAIR members that are using People Soft software or implementing the new system. Let's talk and share our experiences.
Becky Brodigan Program Chair Pittsburgh Conference *Table 4*	**Focus Group 1: The Pittsburgh Conference** A focus group to elicit information on the strengths and weaknesses of this year's conference led by the program chair of next year's conference. By invitation.
Local Arrangements Chair Pittsburgh Conference *Table 5*	**Focus Group 2: The Pittsburgh Conference** A focus group to elicit information on the strengths and weaknesses of this year's conference led by the local arrangement chair of next year's conference. By invitation.

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Tuesday, November 16, 1999 continued

8:00 – 8:50 a.m. *Courageous* **Best Paper 1998** Emily Thomas, Director of IR SUNY Stony Brook Gayle Reznik, Research Assistant SUNY Stony Brook William Dawes Undergraduate Director Department of Economics SUNY Stony Brook Moderator: Corby A. Coperthwaite	**Using Predictive Modeling to Target Student Recruitment: Theory and Practice** In the competitive market of student recruitment, college admissions offices are experimenting with the use of predictive models to increase the effectiveness of their recruitment efforts. Regression analysis is used to estimate students' probability of enrollment, then different recruitment activities are directed at students with different enrollment probabilities. This paper argues that a typical use of predictive modeling is theoretically unsound and may therefore be operationally inefficient. To test this hypothesis and explore an alternative use of predictive modeling we designed and assessed an experimental recruitment program. The first-year results confirm our perspective and identify a valuable role for statistical modeling in recruitment management. Paper
8:00 – 8:50 p.m. *Freedom* Jim Trainer, Director HEDS Consortium	**Higher Education Data-Sharing Consortium** Special Interest Group
8:00 – 8:50 a.m. *Newport* Mitchell S. Nesler Director of Research, Academic Programs Regents College Moderator: William Stuart	**Factors Associated with Retention in a Distance-Based Liberal Arts Program** Analysis of student characteristics related to graduation was conducted in the Regents College Bachelors Liberal Arts program. Student files were examined to determine which demographic, academic and administrative variables are associated with graduation from the program. One of the strongest predictors was preparation upon entering the program. Specific risk factors were identified. Paper
8:00 – 8:50 a.m. *Weatherly* Laura M. Stapleton Associate Director Office of Institutional Studies University of Maryland Gregory R. Hancock Associate Professor Measurement, Statistics and Evaluation University of Maryland	**Multilevel Modeling Using Data From the National Study of Postsecondary Faculty** This workshare will introduce the concept of multilevel data modeling using a short lecture and presentation of an example analysis. Audience impressions to help space future presentations would be obtained regarding interpretations that can come from multilevel analyses and the likeliness of use of multilevel modeling in the IR community. Workshare

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Tuesday, November 16, 1999 continued	
8:15 – 9:50 a.m. *Enterprise* Terrence Russell Executive Director Association for Institutional Research Florida State University Marsha Krotseng AIR President Associate Provost Cleveland State University Moderator: Penny Blackwood	**Town meeting on National Data Policy: New AIR Activities Supported by NCES** This panel will discuss two programs. In 2000, AIR working with its state and regional affiliates, and with the support of NCES, will present some forty workshops on the use of the new web-based IPEDS data collection system. AIR also is organizing a new national peer analysis system with NCES support. The Volunteer Institutional Online Information System (VIOLIN) will enable web-based collection of Peer analysis data as a supplement to IPEDS information. Panel
9:00 – 9:50 a.m. *Courageous* Marcia M. Lee, Director Institutional Research & Planning West Chester Community College Moderator: Eleanor Swanson	**Measuring Student Success in Remedial Education** The National Center for Education Statistics U.S. Department of Education reports that two-fifths (41%) of the freshmen in public 2-year colleges were enrolled in one or more remedial courses in Fall 1995. With such a heavy investment in remedial education, a means for measuring the success of these programs is becoming all the more imperative. This paper presents an argument for using a variation of the Student Right to Know methodology to measure student success in remedial education programs with eight criteria to measure student progress along the way. Paper
9:00 – 9:50 a.m. *Freedom* Karl Boughan, Supervisor of Institutional Research & Analysis Prince George's Community College Moderator: Gurvinder Khaneja	**Assessing Academic Through-Put by Means of Aggregate Credit Hour Analysis** Credit hour analysis can usefully supplement standard retention/credential-based outcome assessment -- particularly at community colleges where informal course-taking and degreeless transfers are prevalent. This paper discusses the rationale for including it in outcomes assessment, outlines as systematic approach to credit-based assessment, and provides examples of its application at a large, suburban community college. Paper
9:00 – 9:50 a.m. *Newport* Robert Toutkoushian Executive Director Office of Policy Analysis University System of New Hampshire Moderator: Anne Marie Delaney	**Changes in Resident Demand for Public Higher Education in New England** This study uses data from the College Board to analyze trends in the demand for public higher education among resident students in the six New England states from 1975 to 1998. Statistical models will be used to show how factors such as tuition and family income explain these trends. Paper

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Tuesday, November 16, 1999 continued

9:00 – 9:50 a.m. *Weatherly* Alberta Lipson Associate Dean for Research Office of Academic Services Massachusetts Institute of Technology	**An Evaluation of an Experiment on the Use of Intermediate (+/-) Grades** MIT undertook an experiment, which changed the traditional straight letter grading system to one that used +/- modifiers for internal grade reports only. This experiment was evaluated by student and faculty surveys and by assessing the impact of changes on students' overall CUMs if +/- modifiers were to be used on external grade reports. Workshare
9:50 – 10:30 a.m. *Freedom Foyer*	**Break and Concurrent Special Interest Groups**
9:55 – 10:30 a.m.	**Concurrent Special Interest Groups**
Courageous Ellen Kanarek Vice President Applied Educational Research, Inc.	**Admitted Student Questionnaire**
Enterprise Peggye Cohen Assistant Vice President for Institutional Research George Washington University	**Banner Users** This session will provide an opportunity to continue discussion with your Banner/IR colleagues. Come and hear about the first IR Track at Summit 99 (a big success!) and the upcoming Summit in San Francisco. All Banner users -- veteran, novice or potential -- are welcome.
Freedom Hershel Alexander Senior Research Analyst Charles County Community College	**Two-Year Colleges**
Newport Ayshe Ergin, Chair New Jersey Association for Institutional Research The College of New Jersey	**NJAIR SIG**
Weatherly David Seguin Jamestown Community College	**SUNY AIRPRO**

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Tuesday, November 16, 1999 continued	
10:30 a.m. – noon *Salon IV* **George D. Kuh** **Professor of Higher Education and Director of CSEQ Research Program** **Indiana University**	**The National Survey of Student Engagement & the Role of IR in the Contemporary University** Dr. Kuh will discuss the evolution of the Pew-funded National Survey of Student Engagement in the context of the increasingly important role of institutional research and planning in the contemporary university. **Closing Plenary Session**
Noon – 4:00 p.m. *Columbia*	**Steering Committee Meeting**

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